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ILLUSTRATIONS.

The Choir Screen, St. David's Cathedral.—From a Sketch by Mr. T. G. Jackson, A.R.A. ..... *Double-Page Ink-Photo.*

Glasgow Art Galleries: Competition Design submitted by Mr. James Lindsay, A.R.I.B.A. ..... *Double-Page Photo-Litho.*

House at Sutton Coldfield.—Mr. Ernest Newton, Architect ..... *Two Double-Page Photo-Litho's.*

Blocks in Text.

Sketches, &c., illustrating Article on "Pre-Conquest Architecture in England" ..... Pages 370, 371

Plan, Discharged Prisoners' Aid Building, Glasgow ..... Page 377

Discharged Prisoners' Aid Building, Glasgow.—Messrs. Campbell Douglas & Morrison, Architects ..... Page 377

CONTENTS.

Building Societies 369
Notes on Pre-Conquest Architecture in England.—V. 370
Notes 372
The Royal Institute of British Architects 374
Electric-Lighting Regulations 376
Discharged Prisoners' Aid Society, Glasgow 376
Birmingham Architectural Association 377
Choir-Screen, St. David's Cathedral 378
Competition Design for Glasgow Art Gallery 378
House at Sutton Coldfield 379
The London County Council 379
Competitions 380
Architectural Societies 380
Books: J. K. Frietag's "Architectural Engineering"; R. Harris's "Note-book on Plane Geometrical Drawing"; W. H. Bidder's "Stress Diagrams"; Emden's "The Law Relating to Building"; "Archæologia Oxioniensis"; "National Art Library—Ceramics" 380
Proposed Association of Waterworks' Engineers 381
Student's Column: Metals used in Building.—XXI. 382
General Building News 382
Sanitary and Engineering News 383
Foreign and Colonial 384
Miscellaneous 384
Legal 386
Meetings 386
Recent Patents 386
Some Recent Sales of Property 387
Prices Current of Materials 387
Tenders 387

Building Societies.

THERE is no doubt that during the latter half of the century what are known as building societies have played a large part in the economical condition of the lower middle classes of the country. They have been regarded by thousands of hard-working men and women as the best, often the sole, means of accumulating some savings, and in other cases as the best, and again the sole, means of becoming the owners of the houses in which they live. The advantages of building societies however have, we think, been somewhat over-rated, and it is rather curious that such enormous importance should have been attributed to them by small investors. This very importance has often been the cause of loss, since a kind of idea has grown up that as soon as money was deposited in a building society it was quite safe. It is a matter of common knowledge that scores of people have been ruined by this implicit and unreasonable faith. Although, however, a possibly greater care is now exercised by investors since some of the disclosures of recent years, the liking for this class of investments by certain persons does not at all diminish. It may, therefore, be desirable to take advantage of the publication of the third edition of Mr. Wurtzburg's standard work on the Law of Building Societies to point out some of the most noticeable features in regard to the growth of case law and legislation in connexion with them.*

Building societies are of two definite kinds, namely, terminating and permanent: the former were more in favour at the beginning of the movement than they are at present, and consequently the importance of the permanent societies as a whole is continually on the increase. Another cardinal distinction also is that between unincorporated and incorporated societies. The former were created under the Building Societies Act of 1836, the first statute to establish these bodies. This old statute was repealed by the Building Societies Act of 1874, with a proviso that this repeal should not affect any society in existence in 1874 until it obtained a certificate of incorporation. The result, of course, is that unincorporated societies are gradually growing fewer in number. This number will shortly be still further diminished, since by the Act of 1894 the Act of 1836 shall be repealed as to all societies certified after 1836 not later than August, 1896. It is difficult to understand why the Legislature could not once for all have put an end to all differences between the two classes of societies, and make but one class, namely, incorporated societies. It is equally astonishing that opportunity was not taken of the legislation of 1894 to pass a single consolidating and amending Act. At present incorporated societies are regulated by five statutes, extending from 1874 to 1894. Some sections of the earlier statutes have been repealed, with the result that the Acts, as they stand in the Statute Book, are not a plain and uniform code. Nothing is more desirable in regard to such institutions as these than that the statute law which regulates them should be in a single Act, which can be easily read and understood by ordinary individuals. To have the Acts as they now are is neither more nor less than a piece of legislative laziness, since it would be perfectly simple and easy to enact one plain code of law on this subject.

As has been already mentioned, the first Act of Parliament on this subject is that of 1836. The cardinal feature of every succeeding Act has been an increase in the stringency of the regulations for the management of building societies, with a view to the better protection of the money of those who invest in them. This tendency is by no means a favourable commentary on what may be called the voluntary system of management, which has over and over again been found to be too lax. Advances on the security of house property are those in regard to which the greatest possible care is required, so that there may be a large margin in case of a depreciation of the property. But there is no sort of transactions in regard to which greater mistakes have been made. Thus it is obvious that this greater stringency was necessary, and it is only to be regretted that the loss of the savings of many thrifty people, who have relied implicitly on the judgment of those put in charge of building societies, should have been necessary to procure amendment in the law. A striking example of the increased strictness of management and of the lessening of the freedom of judgment on the part of those in authority, is to be found in regard to second mortgages. "In many societies," writes Mr. Wurtzburg, "advances on second mortgage are expressly forbidden by the rules, and this very wholesome provision has now been adopted by the Legislature and made universal, Section 13 of the Act of 1894 providing that an incorporated society shall not advance money on the security of any freehold, copyhold, or leasehold estate, which is subject to a prior mortgage, unless the prior mortgage is in favour of the society making the advance." Singularly enough, however, the provision does not extend to societies in Scotland or Ireland, which in 1894 were allowed by their rules to advance money on second mortgages. The shrewdness of Scotchmen is proverbial, but we can hardly suppose that that was the reason which induced the legislature to limit the extent of the provision. This, again, is a curious instance of the half-hearted way in which social reforms, even of a small kind, are frequently carried out.

Again, also, the provisions of Section 40 of the Act of 1874, in regard to the annual statement, have been amplified, especially in regard to mortgages, by the second Section of the Act of 1894. It is sufficient to refer our readers to the statutes for the purpose of a detailed comparison, and to say here that the object of the change is to give as much publicity in regard to these securities as possible, so that shareholders may be able to form some kind of judgment on their value. While we are referring to instances in which the Legislature has put restrictions on the conduct of those in charge of building societies, we may call attention to the very salutary provisions of the twenty-third Section of the Act of 1894, by which "no director, secretary, surveyor, solicitor, or other officer of a society shall, in addition to the remuneration" he may receive from the society, "receive from any other person any gift, bonus, commission, or benefit." If he does he is liable to a heavy penalty. Righteous as the provision is, it may be doubted whether it will have much effect where an officer is so forgetful of his duty as to take commissions from persons with whom he is in negotiation. It is to the interest of all parties to such transactions to keep silence about them, and the difficulty of discovering them is great. This is an instance of what, while it is obvious, is not sufficiently borne in mind by those interested in building societies—

* "The Law Relating to Building Societies." By E. A. Wurtzburg, Barrister. London: Stevens & Sons, Ltd. 1895.

namely, that the best check on any form of mismanagement is careful supervision of the work of the society by those whose savings are placed in it. No doubt a large proportion of investors are not men of business, but many others are. Nothing is more remarkable than the fact that such persons take so little trouble to look after their affairs in regard to building societies, and rely, with a childish confidence, on paid officials and directors.

While touching on officials, it is important to bear in mind that it has been judicially decided that a surveyor who is employed by a society to value property is bound to use reasonable care and skill in the task. An instance of this principle is to be found in a comparatively recent case which is referred to by Mr. Wurtzburg, in which a society advanced 350*l.* on mortgage on the faith of a report negligently made by their surveyor that the property was worth 464*l.*, whereas its real value was only 216*l.* The result was that the society recovered the difference from the surveyor. We confess that this case appears also to be an instance of the want of judgment which has so often been shown by directors of building societies. A house which is valued at 464*l.* is not in our opinion sufficiently good security for a mortgage of 350*l.*

In conclusion we can only say as emphatically as possible that, valuable as are the alterations which have gradually taken place in the law of building societies by means of legislation and of judicial decisions, losses must from time to time occur, unless careful supervision is exercised by officials and by investors, and that a prudent man will never assume that by investing in a building society he is putting away his savings in safety. He must give to the work of the society some personal attention.

NOTES ON PRE-CONQUEST ARCHITECTURE IN ENGLAND.

By Professor Baldwin Brown.

V.—*The Tradition of Rome.*

BEDE tells us that in the Northumbria of his day there still remained the "cities, towers, bridges, and paved roads" of the Romans, while he knows also of "towers at intervals on the shore of the ocean to the south overlooking the sea," which we now call Reculver, Richborough, Lymne, Pevensey, and Porchester. Monuments of Roman handiwork are still visible on various sites in some score of English counties. "Certes," so runs the phrase in the English "Camden," "they are works of exceeding great admiration and sumptuous magnificence," while to the contemporaries of Bede such remains must have been far more in evidence than could be the case in the days of Camden or in our own. It becomes needful, therefore, to inquire as to the extent to which Roman influence is apparent in the form and technique of pre-Conquest churches.

In respect of general form, attention has previously been called to the non-Roman look of so many narrow, square-ended, Saxon churches, and this subject will be returned to on a subsequent occasion. The present paper deals only with some points connected with material, technique, and the design of details.

An examination of pre-Conquest buildings from the point of view of our knowledge of Roman technique leads to the following results. We may distinguish between brickwork and masonry. In the case of the former, we have as our starting-point St. Pancras at Canterbury, for the remains at Silchester are too slight to afford evidence of technique.* Whether St. Pancras is Romano-British or Early Saxon, it shows excellent and regular Roman brickwork, as may be seen from the subjoined comparison of a portion of the north wall of its porch

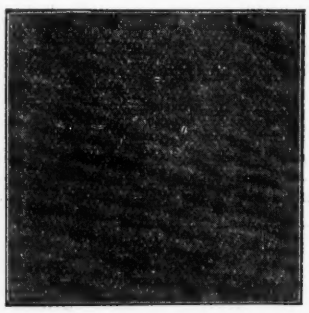


Fig. 26.—Brickwork from West Porch of St. Pancras, Canterbury.

with some brick facing from the Baths of Caracalla at Rome (figs. 26 and 27). Apart from St. Pancras, and, as we should probably be right to add, Reculver, the Saxon use of Roman brick is of a somewhat hap-

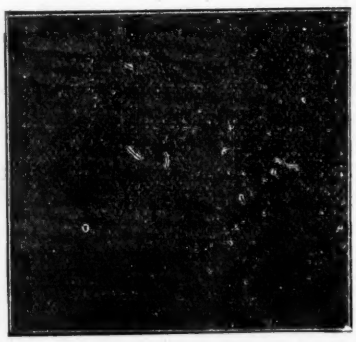


Fig. 27.—Brickwork from Baths of Caracalla, Rome.

hazard character. Employed occasionally in walling, it is most often used for turning door and window arches, and occurs in this connexion where the walling is of ordinary Saxon stonework. There are examples in the tower doorway at Brixworth (fig. 28)

Fig. 28.—Brixworth.

(note also bricks irregularly used in the walling), in nave windows at St. Nicholas, Leicester, and Arlington, Sussex, and a tower window at Swanscombe, Kent. One of the two enigmatical arched openings at the east end of the nave at Britford, near Salisbury, is turned in the same material. Although, however, the Saxons found this use of Roman brick convenient, they do not seem to have taken much trouble either with the fabrication or use of the material. Whether or not they made these bricks themselves is an open question. Their handling of stonework is a more interesting matter.

It is often assumed that Saxon masonry must, almost necessarily, be a continuation of Roman. The Teutonic invaders, it is pointed out, had been only accustomed to build in wood, and could not bring with them any tradition of work in stone. The survival of Roman monuments as attested by Bede, as well as the often-quoted narratives about the introduction of foreign artificers trained in Roman technique by those typical Early Saxon builders, Wilfrid and Benedict Biscop, appear to indicate the source from which Saxon forms must have been derived, and as the buildings erected by the last-named were "in the Roman manner," it has been assumed that this same manner became stamped on all the stone structures of the country. It has been stated above (p. 252, *ante*), that the "Roman manner" is not very apparent in the supposed work of Benedict at Monkwearmouth, and it must be said further that, in comparing Roman stonework generally with Saxon, we find the points of resemblance more than balanced by pronounced differences. These differences are sometimes fundamental, but they are almost equally marked when the particular feature in question may, in its ultimate origin, be Roman. In certain respects the technique of the Saxons is distinctly non-Roman, while on sundry features borrowed at first from Rome they put a native stamp that renders them essentially Old English and not Classical. We may test the truth of this in connexion, first, with the fabric of walls, and then with such features as arched openings, stone quoins, and column shafts.

What is the most prominent feature about Roman masonry? Surely it is the scientific disposition of the materials into core and facing. In some Romanised regions of the Continent, such as North-Western France, this method of construction, established by the legionaries, lasted on, without any break of tradition, throughout the early Romanesque period. Fig. 29 shows a portion of the masonry of a country church near Tours, dating probably from the tenth century, that exhibits walls constructed of rubble with a facing on each side composed of small square stones of Roman type, and this same "*petit appareil*" occurs in many other early churches of the Loire valley, as well as in the better-known "*Basse Œuvre*" at Beauvais. In other examples in this region, such as some Norman village churches of the eleventh century in the vicinity of Caen, the Roman technique of "herring-bone" facing is perpetuated. It is only exceptionally that we find in the early Romanesque period the sort of irregular, unsystematic stonework, which is, on the other hand, the rule in the pre-Conquest monuments of our own country.

The present writer is at a disadvantage in dealing with a matter like the construction of walls, as he does not enjoy the opportunities offered from time to time to the professional architect of pulling old buildings about or

Fig. 30.—Ruined Wall at Sockburn-on-Tees.

repairing them. It is only, therefore, under correction that he puts forward the statement that Saxon walls are not constructed on the Classical "core-and-facing" system, and are accordingly fundamentally different in principle from Roman. In the North of England the walls of Saxon stone churches are comparatively thin, and apparently of

* By an oversight, on the sheet of plans given on p. 216, *ante*, the apse at Silchester was marked as if it turned to the east. It really points westward, and in this the building is exceptional among our early churches. This does not, of course, militate against its being a Christian church, and an early one.

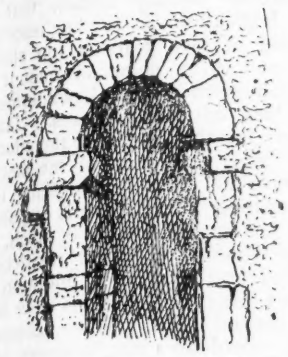


Fig. 31.—Doorway in North Transept, Stow.

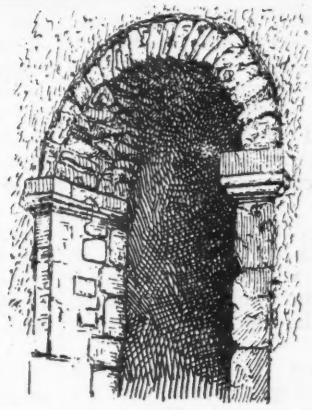


Fig. 32.—Tower Arch at Warden, Northumberland.

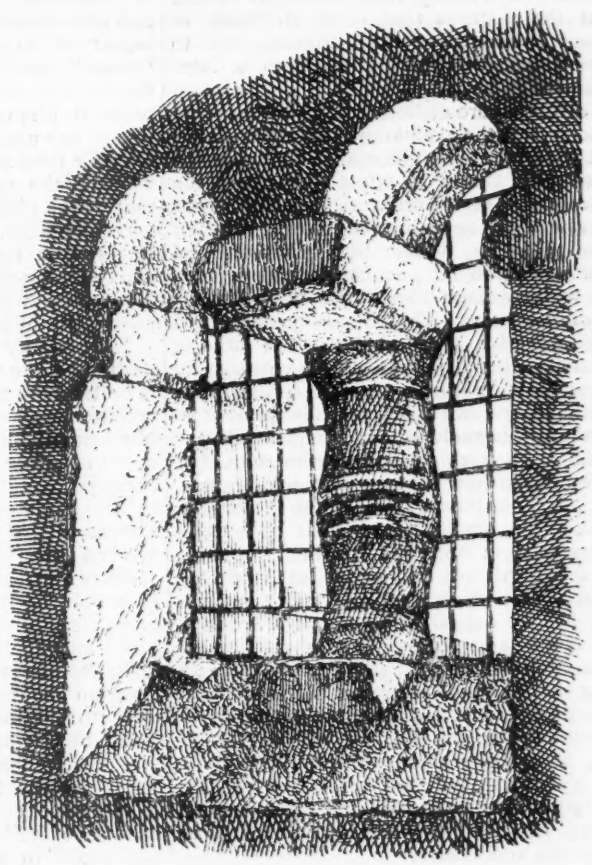


Fig. 33.—Windows in Tower, Barton-on-Humber.

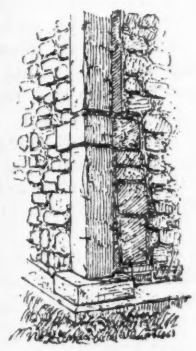


Fig. 34.—Quoin at Wittering, Northants.

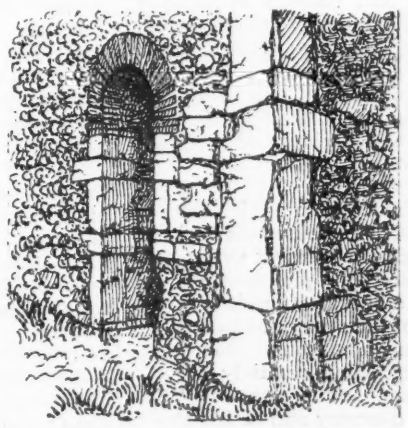


Fig. 35.—Corner of North Transept, St. Mary, Dover Castle.

the same irregular texture of masonry throughout. Fig. 30 exhibits the top of such a wall as it appears in its ruined state at Sockburn-on-Tees, where Mr. Hodges has identified a Saxon chapel. The stones that form the faces nearly meet in the middle, and the whole is rudely though solidly put together of blocks very imperfectly squared. In the south the walls of the churches are often more substantial, while the material is not so good. Those of the tower of Clapham Church, near Bedford, are about four feet thick at the base. The construction is, however, equally unsystematic, and the facing never of Roman character. Brixworth (fig. 28) is perhaps an extreme instance of irregularity, just as Bradford-on-Avon is exceptional in the accurate squaring and fitting of its stones. Most Saxon work is intermediate between the two. Only in one instance known to the writer, that of the south wall of the present chancel at Jarrow-on-Tyne, the sister-house to Wearmouth, does the surface of a Saxon wall incline one to exclaim, Here is masonry of Roman type! Considering how Roman is the *petit appareil* in Northern France this fact is somewhat remarkable.

To this it may be replied that the pre-Conquest walls in question were meant to be plastered, and that their structure and facing were in consequence of little moment. The same remarks, however, apply to Roman and Romanising work on the Continent, in which structure and facing were alike systematic. The Romans, as Professor Middleton has shown ("Ancient Rome," ch. 2), took as much pains with wall facings which they meant to cover with plaster or incrustations, as if they were to be left exposed. So, too, the "primitive Romanesque" (Chanceau) (fig. 29), was intended to have plaster, and this actually remains on the other side of the church. The intention of plastering does not seem to have made much difference in walls built in the "Roman manner," and need not be taken account of in the present argument.

The use of plaster in itself is a further point. Lime plastering, like arch construction, is a contribution to architectural practice that Rome herself inherited from earlier peoples, and passed on to the younger lands of the West. The Saxons seem to have employed this technique, as they employed the arch, from the date of the earliest of their monuments that have come down to us, and to this extent they certainly built *more Romano*. The use of the arch in Saxon churches is, however, significant of the real position of their builders. Save in exceptional cases, it does not lead on to the employment of the vault. The apses of Saxon churches possessing these features were doubtless vaulted, but it is only in the case of Wing (Bucks) and Worth (Sussex), both apparently late examples, that the actual vaulting has survived. The other instances

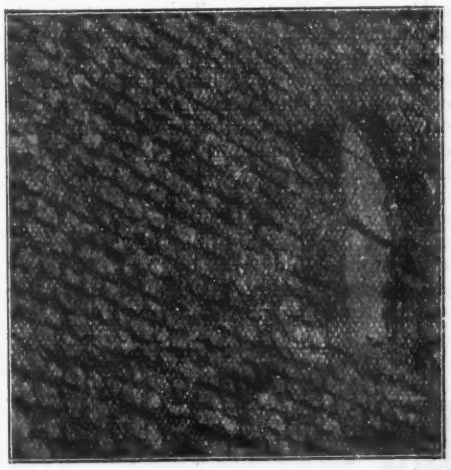


Fig. 29.—"Petit Appareil," from Chanceau-sur-Choisille, near Tours.

of Saxon vaulting are in the crypts of Wilfrid (at Hexham and Ripon) and the porch at Monkwearmouth. The former structures are of great importance, as their date is unquestioned, but it has not been necessary in these papers to describe them. In the above-ground structures with which we are occupied, the barrel vault that covers the Monkwearmouth porch is a unique feature, to which no parallel in Saxon work is known to the writer. To return to the arches: the best examples among those that are probably of early date are the ones at Escomb and Corbridge, and in the above-named porch, and it is very possible that these are not merely "in the Roman manner," but actually Roman structures taken down from Classical buildings and re-erected where they are at present found. Besides these, there are other fairly well constructed Saxon arches of wide span, but these occur either beneath towers or at the crossings of cruciform churches, in both of which cases a comparatively late date must be assumed, and we may account for the good work by the general advance in European architecture which marks the eleventh century. Had the Saxons learned the technique of arch-construction by direct tradition from the Romans, as it was learned by Continental artificers, they could not have made the curious blunders in the cutting and fixing of voussoirs which we find from time to time, as for example in the north transept doorway at Stow (fig. 31). The windows of "primitive" churches in Northern France never exhibit these aberrations, but are arched with wedge-shaped stones with radiating joints. It is partly no doubt through their ignorance of this elementary branch of stereotomy, that the Saxons cut arch-heads out of a single stone, use Roman bricks where they could obtain them, and resort at times to the rubble construction shown in the tower-arch at Warden, Northumberland, given in fig. 32.

The imposts of this tower-arch at Warden introduce us to a new feature—the pre-Conquest moulding. The imposts of the tower, chancel, and door-arches of Saxon churches are either (1) square in section; (2) chamfered beneath; or (3) diversified with mouldings of greater or less elaboration. In some cases these impost stones, like the voussoirs, seem to be actually Roman, while in many instances they are moulded into forms closely resembling those found on Roman altars and tombstones. This similarity may be made the ground of an argument for the early date of those buildings in which the features in question appear. Thus, the arch between nave and tower at St. Mary's, Dover Castle, has imposts as Roman-looking as those at Warden. The grounds on which a later origin is ascribed to this and other cruciform churches, are,

however, so weighty, that it will be well to treat the features that occur in them as rather Romanesque than Roman, and to reserve consideration of them to a later occasion.

Features more elaborate than the moulded imposts are the well-known baluster shafts that are used, most commonly, to divide the openings of double or triple windows in the belfry stages of towers, and that also occur elsewhere. These are doubtless, in their ultimate origin, Roman, but their form and their use is so far peculiar to this country that we may claim them as a characteristic national feature. That the Romans turned small moulded stone shafts in the lathe is certain. Though there is no passage in Classical literature that describes the technique, we can see the evidence of it in the shafts themselves, for examples with the marks of the turning-tool may be seen, *e.g.*, in the Museums of Leicester and Rouen, and, *in situ*, behind a house in the Watergate, Chester. A similar stone shaft of quite a Classical form occurs in the belfry opening on the north of the tower at Wickham Church, Berkshire, but the more general type has no capital or base, but a series of projections and recesses, either distributed, as at Monkwearmouth (fig. 21, p. 251 *ante*), along the length of a straight-sided shaft, or encircling a shaft of bulging shape as at Barton-on-Humber (fig. 33). The former type, abundantly represented by the Wear and Tyne, may be held to be the earlier; the latter are numerous in pre-Conquest towers, and occur in the nave-openings at Brixworth and Worth.

The method of use of Saxon balusters as "mid-wall" shafts is too well known to need description. The drawing, fig. 33, gives a characteristic example. Continental parallels to these features are hard to find, but a baluster similar in shape and use to our own is to be seen in the old church of St. Pierre, within the grounds of the famous Abbey of Jumièges, the work of William Longsword in the tenth century, and slender turned shafts, somewhat like the well-known ones at St. Albans, occur on the façade of the early church of St. Mexme at Chinon, by the Loire.

Stone quoins and pilaster strips are the last features which claim attention here. The latter are of comparatively rare appearance, and may in the meantime be passed over. The former occur throughout the style, of which they are one of the most characteristic marks. Now it is a noteworthy fact that neither the Romans nor the Normans laid any great stress on the treatment of corners in stonework, and were satisfied with constructing them carefully of well-chosen ordinary wall-stones, whereas the Saxons nearly always emphasised these parts of their buildings by the use of special materials and distinct methods of bonding. As will be seen in the sequel, there is no reason for claiming a native British or Celtic origin for the system, and it seems to have been of genuine Saxon growth—a contribution on the part of the Old English builders to the stock of forms from which the later Mediæval styles were evolved. Many suggestions have been made as to the origin and affinities of this characteristic feature, but there is no space for their discussion. The following summary is all that can be offered.

The Saxon quoins in question are of two kinds, and are composed either of very large and massive stones that lend a ponderous strength to the angles, or else of stones specially arranged according to the fashion known as "long-and-short" work. The big stones are in many cases of Roman cutting, though the Saxons themselves, at any rate in later times, knew how to chisel and saw them with commendable accuracy. The massive quoins formed of them are the finest things in Saxon architecture, and are full of character as well as effective from the point of view of construction. The "long-and-short" work should really be called "upright and flat," for the "short" stone is, or should be, a flat slab laid on the upright and pillar-like block and bonding to the full extent of its surface into the wall. The "short" look is due to the appearance of the flat slab, when, with the wall above and below it, it is covered with plaster up to the line of the upright stones, with the sides of which it then seems coterminous. Both the flat and the upright stones are cut back to receive the plastering, to which they form a vertical border. Such an arrangement can be seen in fig. 34, which shows a well-marked long-and-short quoin at Wittering, Northants, where the upright stones are nearly 4 ft. in height.

The history of the feature cannot be written till the chronology of Saxon churches is better fixed than at present. Taking the cruciform and towered churches as Late, and Monkwearmouth and Escomb as Early, we note that while big-stone quoins are used at every period, long-and-short quoins appear to be of later development. An earlier feature out of which they may have been evolved is the framing of door-jambs, which consists of flat slabs superimposed on upright. If it be true that the western door of the porch at Monkwearmouth (fig. 19, p. 251 *ante*), and the chancel-arch at Escomb are really Roman structures reused—a technical question on which the present writer hesitates to pronounce an opinion—then this method of laying stones is Classical, though the transference of the system to quoins may be due to the Saxon masons. Door-jambs of the same construction certainly occur in Byzantine building. The use of "long and short" in a doorway and of big-stones in a neighbouring quoin may be studied at the north-west angle of the north transept of St. Mary's, Dover Castle (fig. 35).

A full discussion of these interesting features of our Early architecture would only be possible on the basis of a complete statistical survey of the buildings where they occur or whence they are absent. Such a survey is still a *desideratum* for the future, and the present paper has merely treated the subject in the most general way, with a view of showing that Roman tradition is not nearly so potent in the structures of Saxon England as in the work of the corresponding period on the Continent. This fact would, indeed, follow naturally from the break of continuity in our early history, caused by the conquest of the country by invaders who, unlike the Goths and the Franks, were practically untouched by either Christianity or Roman civilisation. This, however, only increases the interest of the study of our Early monuments. The forms and the treatment they show must have had an origin and a history. If not Roman, they were either derived from some alien tradition or were developed independently by the Saxon builders themselves. The next two papers will deal with the question, How far the facts of pre-Conquest architecture may be explained by the traditions of British or Celtic stone building, or by the influence of the old-established technique of timber-work common to the peoples of the North.

NOTES.

ALL those who believe, as we do, that the metric system of weights and measures is the rational one, and that its general adoption in this and every country can only be a question of time, must have noted with interest the information and arguments brought forward by the members of the important deputation from the Chambers of Commerce to Mr. Balfour on Wednesday, and the weighty and statesmanlike reply of Mr. Balfour. The deputation made three proposals: that the metrical system of weights and measures should at once be legalised; that its use should be compulsory after two years; and that every effort should be made to teach it in elementary schools. With the first and third proposition Mr. Balfour is in entire agreement, and no rational person could, as it appears to us, take any other view. In regard to the second proposition it seems equally certain that if compulsory legislation is to be resorted to, the period of two years is too short, and would lead to an immense amount of practical inconvenience and bewilderment among the less educated classes. Time must be given for the results of the education of the rising generation in the metric system to have its effect in preparing the way for the change. Mr. Balfour is disposed to leave the change to develop of itself, as he thinks it would if the legal restriction were abolished, and the gradual adoption of the system by large trading firms were left to have its natural effect. So we believe it would, but it would be a long business, and it would be certainly desirable that it should be settled as soon as possible to what system the young are to be educated. For this reason we believe that a fixed date for compulsory legislation on the subject would be a national benefit; only that two years is far too short a period. In this respect Mr. Balfour has done good service in checking the too rapid march advocated by those who do not represent the less-educated class of traders. But an announcement of a fixed date for the general adoption of the metric system would be a great advantage to the community, and would probably do more than anything else to hasten the change. Why not begin with the new century—a natural epoch for making a fresh start? That would leave a clear four years—double the time suggested by the Chambers of Commerce, and would probably commend itself to public opinion generally.

THE result of the competition for the Cairo Museum is in one sense more satisfactory than was expected at the time. We gave a review of the competition designs under date April 6 of this year, and mentioned that premiums had been awarded to four French architects among the competitors. The conditions of the competition were that the selected design was to become the absolute property of the Egyptian Government, to carry out as it pleased, under its own official Architectural Department. The technical members of the committee, however, recommended that the Egyptian Government should communicate with any one of the four premiated architects, and appoint him to carry out the work, and they have acted on this advice, and have put the work into the hands of M. Marcel Dourgnon. It seems only a pity that this course was not previously determined upon and announced, as it is believed that various English and German architects of note would have entered into the competition, but for the feeling that they did not care to sell a design to be carried out by the subordinate officials of a Department.

AT the annual meeting of the Egypt Exploration Fund, Sir John Fowler, K.C.M.G., in the chair, a general description of the work carried out during the past year was given. It was stated that the excavations carried out at Deir-el-Bahari by M. Naville are now complete, and are reckoned by the promoters as an achievement which is on a level with that carried out at Medinet-Habou, and even Karnac. The artists of the Fund are to go out again this winter, to make copies of the sculptures of the famous expedition to Punt. In connexion with the scheme for the dam at Philæ, last year the terror of archæologists, but now much less formidable, Captain Lyons is about to survey the island and its monuments, making a detailed plan of the whole site. Mr. D. S. Hogarth gave an interesting description of his excavations made at Alexandria during last winter, by which he had hoped to get some information about the Hellenised Jews who flocked into Egypt under the Ptolemies, and to have obtained some discoveries of works of art or of the ancient libraries of Alexandria. However, his excavations showed that whatever objects of art of the best period existed in Alexandria are either under water, in con-

sequence of a general subsidence of the land, or have been extracted long ago; and he has come to the conclusion that no papyri are likely to be found in the city. This being the case, he has advised the Society not to proceed in these works, being of opinion that it is not in Alexandria that we must look for MSS, but higher up the Nile, in the hill villages, where papyri in large quantities are found in tombs and houses, and where Mr. Hogarth is sanguine that examples of early Christian literature—possibly a copy of the New Testament—are more than likely to be discovered.

ROUMANIA has made a handsome contribution to Roman archæology in the stately folio edited by G. Tocliesco,* which embodies the complete publication of the little-known monument of Trajan, on the lower Danube. If the name of Mr. Tocliesco is unfamiliar to English scholars, his co-editors, Drs. Otto Benndorf and George Niemann, are of European fame and are sufficient guarantee for the excellence and thoroughness of the work. The existence of the monument was practically unknown till 1837, when Fredrick William III., at the request of Sultan Mahmud II., sent a commission of four Prussian officers to inaugurate certain military reforms in the district. They penetrated to the modern village of Adamklissi, and in reporting on Trajan's wall made mention of the dome-shaped fortress 40 ft. by 100 ft. in size. They conjectured that the monument was a mausoleum, and noted that it had been despoiled of many architectural features, pillars, capitals, architrave, and sculptures which lay scattered about the neighbouring fields. Since then individual travellers have noted the monument in passing, and in 1890 Niemann and Benndorp undertook its complete exploration. All the loose architectural fragments as well as the sculptured metopes have been conveyed to the museum at Bucharest. The present book is the result of these investigations, and it will be invaluable to the study of late Roman architecture and sculpture. The metopes, forty-nine in number, refer to Trajan's Dacian campaign, and are of very unequal merit. They are all published in phototype-plates, and form a series as valuable historically as from the point of view of art. These sculptures are dated beyond the possibility of question by the dedicatory inscription, a great part of which is extant; the dedication is by Trajan himself to "Marti ultori." The monument is of course a military trophy, not a mausoleum. The exact occasion of its erection, the significance of the sculptures, and every architectural detail, are fully discussed and illustrated in the text.

THE official report of the proceedings at the Russian Architectural Congress at Moscow (which has reached us somewhat late) shows us that this second gathering of the Russian architects must have been a very successful one, though we miss several well-known names on the list of members. The report explains that the gathering was the second one, the first having been held in 1893. There were about 350 present at the opening meeting, no less than sixty-five public bodies being represented. The Chairman of the Moscow Society of Architects, M. Bikowsski, presided. The work of the congress was divided into four sections—I. Architectural Art; II. Construction and Materials; III. Building Hygiene; and IV. Building Law; and a special exhibition was opened in connexion with the congress. This exhibition included some important designs, such as the new Cathedral at Warsaw, and an interesting collection of drawings illustrating the temporary buildings for next year's Nischni-Novgorod Exhibition. Numerous papers were read, and some animated discussions followed. The congress, it appears, will lead either to the formation of a National Architectural League or the amalgamation of the various existing architectural societies.

* "Das Monument von Adamklissi." Tropæum Trajani; unter Mitwirkung von Otto Beundorf and George Niemann. Herausgegeben von G. R. G. Tocliesco. Wien. 1895. Hölder.

OUR official contemporary, the *Centralblatt der Bauverwaltung*, gives a long description of the recent structural and decorative alterations at the Berlin Opera House. These alterations have been pending since 1889, when the new theatre regulations were introduced in Prussia; but instead of setting an example of speedy compliance with the code the Court officials practically opposed the very necessary improvement of the building. Whilst the alterations were most strictly enforced on the private theatres regardless of cost, the "Match-box" or "Mouse-trap" (under which names the structure was best known among firemen) was allowed to nightly assemble its large audiences; all manner of excuses were brought forward; and when the reconstruction was eventually decided on it was done so reluctantly and so slowly that an outsider, Herr Heim, had to be called in to supersede the officials. The alterations comprise the rebuilding of several staircases, a general rearrangement of the lobbies, and some alterations to the corridors; the auditorium, *foyer*, and vestibule have been remodelled and redecorated, and a new system of central heating and ventilation introduced. The stage, with its appliances, has been thoroughly modernised, and the whole of the offices rendered more convenient. The heating arrangements perhaps caused most trouble, owing to the boilers and machinery having to be put up at some distance from the building and the ducts taken under an important roadway. The building is the property of the nation, and the Court is the lessee.

THE accident to the Eastbourne express, like the more recent and more serious affair at St. Neots, appears to have been attributable to some defect in the permanent way. Colonel Addison's Report upon the former occurrence has just been issued, but the cause of the accident still remains very much a matter of conjecture. The Board of Trade Inspector had, however, enough evidence before him to warrant the observation that "sufficient attention had not been paid to details" in connexion with the examination of the line at this particular spot. The regular and thorough inspection of every foot of the permanent way is of the first importance, and although the Report states that the defects observable in this case were not serious, it is clearly implied that they may have contributed to the derailment of the carriages. This was a sufficiently serious matter, and it is a matter for congratulation that so little harm resulted. That no great damage was done was due to the action of the automatic brakes on the rear portion of the train, and also to the reduced speed. Had the train been travelling at the same rate of speed as the East Coast Express, the "few loose keys" might have been responsible for a lamentable loss of life.

EVERY engineer and surveyor who has had much survey work to do has felt the need of some instrument for ascertaining horizontal distances, as the present method of measuring between two points by means of a chain is tedious, and is one which does not give accurate results when the surface of the ground is not level. Of course, many instruments have already been devised for this purpose, but the latest, namely, the "Terrameter," invented by Mr. J. Donnan, Assistant Engineer in the Public Works Department, India, seems to be the best suited for everyday work. This instrument is provided with an ordinary theodolite telescope, on one of the trunnions of which an arm is fastened, and arranged to move freely in the same plane as the telescope, so that the lower end of it will indicate, by means of a scale fixed on the body of the instrument, the vertical angle traversed. In connexion with the instrument it is necessary to use a staff, upon which two large discs (2 ft. diameter) have been fixed at a vertical distance, say, of 10 ft. When the horizontal distance between two points is required, the "Terrameter" is set up over one of them, and the staff is held over the other. The operator then reads the space traversed by the bottom of the arm above alluded to when he sights first on the lower and afterwards on the upper of the discs, and with this information the distance between the two points can at once be ascertained by referring to a set of tables, calculated for the particular distance the discs of the staff are apart. For measurements less than 1,000 ft. from the instrument, a variation of 1 ft. can be easily detected on the scale, and as the "Terrameter" can also be used as a theodolite and level, it will no doubt be found of much service in the field.

AT the invitation of the Master and Wardens of the Worshipful Company of Carpenters, a large number of gentlemen interested in technical education, including Mr. F. C. Penrose, P.R.I.B.A., attended at the Trades' Training School, Great Titchfield-street, in order to inspect the workshops which have been inaugurated by the Carpenters' Company and six other City Companies. A short address was read by Professor Banister Fletcher (to whose exertions the establishment of the schools is mainly due), as Chairman of the Executive Committee of the school, in which he referred to the fact that the gradual abandonment of the apprenticeship system had rendered it imperative that the education of the craftsman should be fostered and extended by some such means as that provided by the Trades' Training School. Each workshop was then visited. In the Tylers' and Bricklayers' rubbed and other brickwork, from carefully-prepared geometrical drawings for difficult problems, was shown. In the masonry-shop, one of the most interesting to architects, the first prize has been awarded to a model, one-eighth full-size, of one bay of the cloisters of Gloucester Cathedral, executed in clunch stone; elliptical staircases, with winding stairs and raking arch, domes, and circular-headed tunnel-vaults were other samples, all demanding an absolute knowledge of descriptive geometry. In the carpentry and joinery schools some excellent work in roofs, joints, and floors were shown, and in the plumbing-shop successful demonstrations of the adaptability of lead to ornamental and sanitary work were exhibited. In the Plasterers', Painters', and Wheelwrights' shops the technique is good, and artistic design will no doubt be developed as the craftsmen proceed in the more advanced stages—a remark which is well justified by the work in the wood-carving classes. The Smiths' shop, which has only just been started, completes the list of all the building trades which are thus conveniently placed under one roof. In connexion with the instruction given in each trade, we are glad to see that the craftsmen are not treated as machines for the execution of designs, but that each goes through the whole routine, from drawing his work out to scale, detailing, cutting his working moulds, and lastly fixing his work up.

THE Annual Report of the Willesden District Surveyor, Mr. O. Claude Robson, is, as usual, an admirably drawn-up document, and touches on a great many points of interest in regard to local improvements in this important district. Among other things it is remarked that the public authorities ought to have greater powers of control over the water companies in regard to the breaking up of roads and the depth at which pipes are laid; some of the latter, when the great frost of last winter drew painful attention to the subject, being found to be laid at a depth of only one foot below the surface. The Report strongly recommends the periodical flushing of

all house-drains as efficiently as the sewers are flushed. Complaints as to obnoxious odours from ventilators "are mostly received during dry seasons when the house-drains receive nothing but the domestic sewage, and but little rainfall descends upon the roofs of the houses for flushing purposes. In such cases, when a complaint is received as to a particular ventilator, instructions are given for flushing to be administered to the house-drains in the neighbourhood, by means of a 2½-in. hose with a strong pressure of water from the mains. The result is that in nearly every case a blocked or foul syphon is discovered very close to the offending ventilator, the medium of blockage or fouling being very often a large collection of grease that should have been intercepted, and which when decomposed gives off one of the foulest odours that can be experienced. With the flushing of the house-drains and the removal of the blockage the complaints cease as to foulness of sewer, until possibly the syphon again becomes choked with solids." The River Brent still remains without improvement, the water above the Willesden Sewage Works being dammed up in the Welsh Harp reservoir during dry seasons, and suddenly discharged during periods of heavy rain by sluices, a process which destroys the bank and bed of the stream, and often causes serious flooding in the fields and roads. There are many other points of importance touched on, and those who live in or are interested in the neighbourhood of Willesden should procure the Surveyor's Report and read it.

WRITING to the *Times*, Mr. Ashbee, Chairman of the Committee for the Survey of the old Memorials of Greater London, directs attention to a proposed scheme whereby the Trinity House Corporation seek to dispose of their almshouses, with the extensive ground on which they stand, in Mile End-road. The older buildings, of red brick, and two stories high, range north and south along two sides of a spacious planted quadrangle, at the remoter end of which is the chapel, containing some stained glass removed from the old hall of the Trinity House at Deptford. Behind these are some later buildings, in yellow brick, with the statue, originally at Deptford, of Captain R. Marples, *obiit* 1680. In the front court, which is open to the main road, is the statue, erected in 1745, of Captain Robert Sandes, an Elder Brother, who died in 1720, bequeathing to the foundation the reversion of an estate in Lincolnshire. On each of the two gable ends, towards the gates, is an ornamental tablet thus inscribed:—

THIS ALMESHOUSE wherein 28 decay'd Masters & Comanders of Ships or y^e^ widows of such are maintain'd was built by y^e^ Corp^o^ of TRINITY HOUSE An. 1695. The Ground was given by Cap^n^ HENY MUDD of Rattcliff an Elder Brother, whose widow did also contribute.

The houses, rich in carvings, inscriptions, coat-arms, old lead work, cisterns, and the like, and carrying four interesting old models of ships, are very little changed from the appearance they present in S. Gribelin's print. Mr. Ashbee refers to the tradition that they were designed by Sir Christopher Wren, who, he says, was employed in surveying an estate in Stepney and Mile End.* The "Ambulator," 12th edit., 1820, says that in one of these houses the widow of Captain Cook found an asylum. She died in 1835, and was buried with her sons in St. Andrew's-the-Great, at Cambridge, beneath her husband's cenotaph.

WE understand that at the instance of Mr. E. E. Newton, of Hampstead, the Society of Arts have agreed, the owner and tenant consenting, to affix a memorial tablet on the house in John-street, Hampstead, where Keats lodged during most of the period 1817-20. The house is one of the two that were formerly called Wentworth-place, and were once occupied by Charles Wentworth Dilke and Charles Armitage Brown: it is now known as "Lawn Bank." In the other house lived Mrs. Brawne and her daughter Fanny, with whom—according to Howitt's "Northern Heights of London," Keats and his younger brother Thomas (*obiit* 1818) had lodged before they removed to Mr. Brown's next door; and W. M. Rossetti says, in his edition of Keats' poetical works, that Fanny Brawne was for a while an inmate of Mr. Brown's house "to be out of the way of some domestic discomfort." The identity of "Lawn Bank" had long been a vexed question among admirers of the poet, including his editor Buxton Forman, but was determined by Mr. Sidney Colvin, who, in the *Athenæum* of September 12, 1885, described a visit he made there in company of the late William Dilke in July of that year.

THE Fine Art Society announces an exhibition, early next month, of Mr. Whistler's collected lithographs, which will be an incident of considerable interest in the artistic world.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second meeting of the present Session of this Institute took place on Monday last, at 9, Conduit-street, Mr. F. C. Penrose, M.A., F.R.S. (President), in the chair.

Portrait of a Past-President.

Sir A. W. Blomfield, A.R.A., said that it became his pleasing duty, as the representative of a large and enthusiastic body of friends and subscribers, to present to the Institute the long and anxiously-expected portrait of the late President, Mr. Macvicar Anderson. If he was not aware of Mr. Anderson's retiring and modest nature, which would make any praise of himself in his presence somewhat embarrassing, if not painful to him, he could have wished that he had been present that evening, to give them the opportunity of comparing the well-known form and features of the living man with their counterfeit presentment in the portrait by Mr. Charles Furse. He was sorry to say that the painter had been obliged to go to the South of Africa to recruit his strength after severe illness, which was the cause of the long delay in finishing the portrait. He thought he might confidently predict that henceforth it would be regarded as one of the most interesting and valuable of the numerous memorials of former Presidents which were on the walls. No one would doubt what a very great pleasure it was to be called upon to perform such a duty, yet the duty, pleasing as it was, had its difficulties, for the great debt of gratitude the Institute owed to Mr. Anderson was in itself an element of difficulty. It would be impossible to speak in adequate terms of the greatness of Mr. Anderson's services without overstepping any proper limits of time, and without indulging in praise which to any stranger might seem like the language of hyperbole. He would, therefore, content himself with reminding them that Mr. Anderson's services had been in many respects altogether unique and unprecedented, so that, in such matters as regular and punctual attendance at Council and other meetings, and generally for his self-sacrificing devotion to the multifarious cares and duties of his responsible position, Mr. Anderson might, if he might use a colloquialism of the day, be said "to have triumphantly broken all previous records and hopelessly distanced all competitors." Speaking of Mr. Anderson as pre-eminently a worker, they must not forget that to his great achievements in that respect he added several qualities, the lack of which were greatly missed by many when they aspired to be leaders of men. The late President possessed the tact, judgment, and firmness necessary to steer them on many occasions through troubled waters, and to bring them out of difficult situations with flying colours and unimpaired credit and honour. In thinking over Mr. Anderson's career as President of the Institute, he was reminded of some lines of Wordsworth, in which he says of a fine character that he is one "Who comprehends his trust and to the same keeps faithful with a singleness of aim." Of the charm of his attractive qualities and his great personal influence, always exercised to some good purpose, and in the most genial manner, it was scarcely necessary to remind them, and it only remained for him on behalf of the subscribers, to ask the President of the Institute to accept the portrait.

Sir A. Blomfield then unveiled the picture.

The President said that it was with great pleasure he accepted the portrait on behalf of the Institute. It was impossible for him to add any more suitable words than had been already said, and, therefore, he would confine himself to returning their most hearty thanks to Sir Arthur Blomfield, and the others who had contributed with him, for offering this beautiful record, which would be a remembrance of a President whose name would never be forgotten as one of the greatest and most useful workers in this Institute.

Intermediate Examination.

The President then announced that a statutory examination was held, under the provisions of Section 140 of the London Building Act, 1894, on November 7 and 8. One candidate had attended and passed, viz, Mr. Harold Griffith, of the London School Board offices, who had been granted a certificate of competency to act as District Surveyor in London. He also announced the result of the Intermediate Examination to qualify for registration as Student, held on 13th, 14th, 15th, and 16th inst. At this examination fifty-one probationers, including sixteen relegated from previous examinations, had applied; forty-two had been admitted, all of whom presented themselves and were examined. Of these twenty-two passed, and twenty were relegated to their studies. The twenty-two, placed by the Board of Examiners in order of merit, were:—

Harold Busbridge, Plumstead, S.E.; Frederick Milton Harvey, Gorleston; John Stevens Lee, West Kensington; Thomas Wilson Aldwinckle, Forest Hill, S.E.; Henry Arthur Battley, East Dulwich, S.E.; Herbert Edward Illingworth, Rawdon, near Leeds; John Frederick Duthoit, Dover, and George Walter Shipway, Peckham, S.E.; Alfred Ralph Keighley, Liverpool; Ernest Henry Alderson Barron, Mannamead, Plymouth; Walter Gray Ross, Norwich; Ethel Mary Charles, Portman-square, W.; Samuel Chesney, Stourbridge; Matthew George Martinson, Bellingham, Northumberland; Alfred Bryer, Brentford; Norman Elliot, Lampton, Hounslow; Edward Vincent King, Bishop Auckland; Arthur Ernest Lacey, Brixton Hill, S.W.; Gerald McMichael, North Malvern; Dudley Christopher Maynard, St. Leonards-on-Sea: Frederick John Sawyer, Brighton; Henry Knowles Wright, Bowdon, Cheshire.

The name of the lady was received with applause.

Sculptured Columns of the Temple of Diana at Ephesus.

Mr. Alexander S. Murray, LL.D, F.S.A., then read a paper on "The Sculptured Columns of the Temple of Diana at Ephesus," of which the following is a *résumé*:—

In opening his paper Dr. Murray referred to the late James Fergusson's views on the subject of the sculptured columns, which had been discussed by him in a paper communicated to the Institute in 1883. Fergusson had supported his views mainly by reference to the remains of the columns at the British Museum. Recently Dr. Murray's department of the Museum had undertaken the task of reconstructing the remains, with a result, however, which varied in several particulars from that arrived at by Fergusson. In working out his restoration, Fergusson had found it necessary to interject between the sculptured drum and the square pedestal an imaginary base. This base, or any intervening base, had been dispensed with altogether in the Museum restoration. The sculptured drum had been found to fit exactly on to the square pedestals, the bed on the top of the pedestals having been eased off on the outer edge for a width of about two inches, apparently for the express purpose of taking the weight off the torus. The effect might seem strange, but instances existed in the sculptured columns of Trajan in Rome and of Theodosius in Constantinople, where the shaft was separated from the pedestal mainly by an enriched torus—such columns, indeed, might have been originally suggested by those at Ephesus. The absence of any intervening member between the drums and pedestals of the front row of columns was not much to be regretted, but coming to the second row there was a difficulty in the columns not having under them some form of base which would range with the Ionic bases along the sides of the Temple. The lecturer here entered at some length into his reasons for thinking that the square pedestals had stood on a lower platform at the two ends of the Temple, citing in this con-

* In the "Dictionary of Architecture," *s.v.* Wren, we read: "1695. Trinity Almshouses; 30 houses said by Wren." In a large collection of papers, prints, &c., relating to Deptford, at the British Museum, is J. P. Malcolm's view 1799, of the old Trinity Hospital there.

nexion the description of the ruins and the measurements given by Wood, from whose views on some points he dissented, and showing in what respects the Museum restoration differed from Fergusson's. For the ascent to the stylobate Wood had proposed a flight of fourteen steps all round the Temple, each with a tread of 19 in.; but as this left an enormous projection of stylobate outside the columns, and as the rise and tread of the steps seemed to be correctly ascertained, Fergusson felt himself driven to assume a sub-platform of three steps, on which platform he placed a series of wide projecting piers, which he supposed to have been richly sculptured. Dr. Murray had taken advantage of this platform for the two ends of the Temple, and had placed on it the sculptured pedestals, in room of the projecting piers which Fergusson had introduced without any trace of evidence among the remains. The thirty-six sculptured columns Dr. Murray disposed as follows: two between the antæ without bases or plinths; a row of eight, also without bases or plinths, resting on the top of the steps; and a front row of eight, raised on square sculptured pedestals to the level of the stylobate, and entirely in front of the steps. With regard to the arrangement of the steps, for the lower platform three steps corresponding to the actual stones now in the Museum had been adopted, while for the upper platform the slightly different dimensions of the great altar at Pergamos had been introduced. So far it had been ascertained that certain of the sculptured columns had stood on square sculptured pedestals, but how many had such pedestals, or whether all of them had not been so enriched, it was quite impossible to say. It seemed incredible, however, that any one of the huge pedestals could have stood on the stylobate. It did not follow, again, that because certain of the sculptured columns had stood on pedestals at a lower level, the whole of the eight front columns had so stood. His own view of the matter, as illustrated in a drawing exhibited, Dr. Murray claimed to be the simplest way which had occurred to him out of a great difficulty. As regards the sculpturing of the lowermost drums of the columns, the lecturer gladly accepted the evidence of certain late Roman coins which professed to represent the façade of the Temple. The much-discussed question as to the interpretation to be placed on the words "una scapo" used by Pliny when speaking of the columns sculptured in relief, was here touched upon, the lecturer suggesting the reading "imo scapo," meaning in Vitruvian language the lowermost part of the shaft. This reading confirmed the coins and was in agreement with the existing remains. With regard to the dimensions of the columns, it seemed probable, from a large fragment sent home by Wood, that the angle columns were of greater diameter, which would imply a proportionate increase in height. It was, however, with the sculptured columns that the Museum was chiefly concerned—were they sculptured on all four sides? In considering this question the lecturer gave a detailed description of the remains, the inferences he had been able to draw from them with regard to the subjects depicted on the pedestals, and the manner in which the fragments had been utilised in the process of restoration. Taking into consideration facts and probabilities, he had arrived at the conclusion that the pedestals were sculptured on all four sides, and that the sculptures were in some cases an identical repetition of subject on all four sides, in others a series of incidents connected together in thought, but not united by an artistic motive. Turning to the earlier Temple of Ephesus, the one burnt by Herostratus, on the site of which the Temple above dealt with was erected, the lecturer described various remains of columns of the building among the collections of the British Museum, dwelling upon their distinctive features. According to Herodotus the cost of most of the columns of the archaic Temple was defrayed by Crœsus—a statement confirmed by Wood's discovery of several parts of a base moulding of the older building on which the name of Crœsus was inscribed as the donor. A capital recently put together from the archaic fragments at the Museum bore a striking resemblance to one from the Temple of Hera in Samos—a fact of peculiar interest, as Rhœcus, the architect of the Temple in Samos, also executed certain sculptures for the Temple at Ephesus. Summing up, the lecturer affirmed his conviction on the following three points—first, that the sculptured drums rested directly on the square sculptured pedestals as they had been placed in the Museum restoration; secondly, that the pedestals were sculptured on all four sides; thirdly, that the sculptured pedestals could not have stood on the stylobate without producing an extremely disagreeable effect.

Professor Aitchison proposed a vote of thanks to Dr. Murray, but apologised for having so little to say on the subject. The proper disposition of the carved columns and the carved square blocks had offered to architects the greatest difficulty of solution. Of late years the restoration of the temples of antiquity had not engaged the attention of so many architects as they formerly did. It was a curious thing that so little contemporary description of this splendid Temple should have come down. There was the short account in Pliny, a few words in Pausanias, Strabo, and Vitruvius, and it really looked as if the descriptions by these authors were merely hearsay, and that none of them had ever seen the Temple, though it was one of the wonders of the world. He had listened with great admiration to the elaborate pains which Dr. Murray had taken to make the pieces fit. He had watched for years the piecing together of the Archaic base, and admired the extreme ingenuity with which these fragments had been fitted together, but without having studied the subject, it would be useless for him to offer any further remarks, except to say how extremely obliged they were to Dr. Murray for what he had done and for what he had said that evening.

Professor Roger Smith, in seconding the vote of thanks, said he could add very little to the learned and extremely interesting paper with which they had been favoured. It had always seemed to him that the recovery of the Temple of Diana at Ephesus had been a kind of triumph for British archæology, and was a matter of which they ought to be proud. Mr. Wood had pursued a scent, which might have easily led him astray, but he had avoided that snare. They were extremely indebted to the Director of Antiquities at the British Museum, for the care with which he had brought together the remains entrusted to his charge, and it was extremely interesting to be able to elucidate some of the things which Mr. Wood had left unsettled, and which it was impossible for him to settle. One might hope that it would be still reserved for some future day to discover further specimens on the site, and if that were the case he had little doubt that in the main they would bear out the views which had been put before them that evening.

Mr. R. Phené Spiers remarked that five or six years ago, when called upon to revise "Fergusson's History," he found himself placed in a singular dilemma. The original account which Fergusson had given of the Temple of Diana at Ephesus was in the edition of 1875, and at that time the data it contained did not differ very much from what had been put forward by Mr. Wood. The only difference, if he remembered rightly, was that Fergusson placed four of the sculptured columns in the pronaos, whereas Wood placed two in the pronaos and two in the postium. Fergusson read another paper to the Institute, which contained some statements of so extraordinary a nature that he (the speaker) really felt it would be unsafe to put them before the student as being the actual arrangement of the Temple. Fergusson, in that paper, happened to have hit upon the happy thought that three times nine were twenty-seven, and he consequently placed three rows of columns, nine in each row, at the back of the Temple, thus arriving at the 127 columns supposed to be named by Pliny. This also gave Fergusson the opportunity of lengthening the Temple, and of thereby introducing two open courts, through which light could be admitted. The idea of the nine columns seemed so impossible as a reasonable restoration, that he (Mr. Spiers) contented himself with reproducing all that had been stated before, and with merely referring the student to the paper read in 1883. It seemed to him that if Fergusson had been able to hear the paper that evening, he might have been willing to accept at once the new information Dr. Murray had submitted, viz., that the pedestals had been sculptured on all sides, and have brought his columns forward. He was near the truth in placing the raised platform round the buildings, but it did not occur to him that the pedestals were sculptured on all the four sides. This was a new phase in the history of the Temple, and the version Dr. Murray had been able to give was the first they had seen, in which the relative height of the square pedestal and the sculpture of the other columns was dealt with.

Sir Henry Howorth expressed the pleasure with which he had listened to the paper, but was somewhat surprised that any Philistine present should be asked to criticise such a subject. He would beg them to pardon him then, if he, for a moment, adopted the attitude of the German professor, who was compelled by the very necessities of his position to find some new theory to justify his own existence. It seemed to him that, at the early stage in the history of the Ionic column, as illustrated in the excavations of Susa and Delphi, they had the primitive column without any fluting, and in the second case they had it with rude fluting. It was a remarkable fact that the introduction of fluting apparently into both the Ionic and Doric column was very widespread, and it might be asked how it was that this great revolution took place in the history of this wonderful feature of Greek architecture. He could not help thinking that the fluting of the column came from Egypt, at the time when the Greeks were considerably indebted for all kinds of new ideas in sculpture and architecture, by contact with the Egyptian Doric columns, which were fluted. If they carried that further they would find the cause and origin for these sculptured columns, of which the only examples in the Greek world they knew of were those in the Ephesian Temple. The period when this was being built, was the time at which Polycrates, with his friend the Egyptian King, was building the corresponding Temple at Samos. In Egyptian temples and buildings these columns were to be found, the upper half, in many cases, free from sculpture, and the lower half surrounded with friezes, after the primitive fashion developed later in the sculptured columns at Ephesus. They might, therefore, have a little side-light thrown on the problem of how the columns stood, if the question was approached from the side of the Egyptian temple, with its columns sculptured in relief. He would have considered this an immediate key to an explanation of the matter, but there were two difficulties which presented themselves when he saw the marvellous reconstruction of the columns entirely due to the skill and knowledge of Dr. Murray. When he had put together the inscription of Crœsus, which gave the date of the column, it showed that it was impossible it could have been placed on a square base, or the inscription could not have been read. There was no doubt that the round drum fitted into a round hole in a square base, and that that square base must have had some kind of round erection placed upon it; but might it not be the base of either a statue or of some kind of erection within the Temple itself, in which the base of the statue was made of the same diameter as the diameter of the column? He could not see the smallest trace of a square base on the many columns he had examined; they all appeared to be circular right to the very ground. It would seem that the great Italian artists, when they painted "The Beautiful Gate" of the Temple, designed it from the idea of Pliny, and planted the sculptured columns directly on the ground, and not on bases. He only put these remarks forward in order to get Dr. Murray on his feet.

Mr. G. A. T. Middleton referred to the peculiar Corinthian column on an elliptical base, in the British Museum, and wished to ask Dr. Murray whether he had come to any conclusion as to where that column had been placed? There were, as was well-known, upon the uncut eyes of one of the volutes in the Museum, certain centre-points and scratchings, and he had asked Dr. Murray at the Museum whether these had been carefully worked out in an endeavour to find out how the volute was described. The answer was in the affirmative as to their having been several times carefully drawn and worked, but in the negative as to the discovery of the way in which the volute was struck. There was, however, an opportunity of comparison with another example in the British Museum, an Ionic capital, in the Mausoleum Room, with an uncut eye, on which certain points were to be seen. This was quite a small capital, and the centre-points were so minute as to escape casual examination.

Mr. H. Heathcote Statham thought they might congratulate Dr. Murray on having brought before them a more probable and a more logical explanation of the part which the square sculptured pedestals played in the Temple than had ever been offered before. For himself, ever since the late Sir Charles Newton showed him on the top of those square blocks the circular drip-mark of the torus, he had had the most absolute conviction on the subject, and he never had the slightest doubt that the square pedestals supported a column. Dr. Murray seemed to have found, by providing a lower platform near the bottom steps, a place for the square pedestals by which they could support a column of the same proportions

as the inner row which would stand upon the upper steps. It seemed to him (the speaker) by far the most probable solution that had yet been afforded them. There was one interesting point in the remains that they had never had an explanation of yet, and which Dr. Murray had touched upon, and that was the one circular sculptured drum which was 3 in. thicker than the rest. It was a very curious consideration as to what part of the Temple that could have belonged to. Dr. Murray suggested that in consequence of its width they might imagine it to have a greater height. He also referred to it as being possibly at the angle of the Temple. Of course, to put an increased width in a column at the angle of the Temple was a perfectly natural and frequent device, though to go to the extent of three inches would be a great deal. But he should be rather inclined to think that the angle position was the explanation of that. At all events, they could hardly imagine where that column could have come if they were to suppose it to be of a different height from the rest. There was another point about that sculptured drum: if he remembered rightly, it showed signs of being a great deal more weather-worn than the rest. [Dr. Murray signified that such was the case.] That would be some indication of where it stood—at all events, an indication that it stood in a more exposed position. When those who were interested in the subject were able to see what was at present in the basement of the Museum, and which would be brought up eventually, they would find a most interesting object in that archaic Ionic capital from the older temple which had been referred to, which had differences of the most peculiar and unexpected nature from the normal Ionic capital, and he was quite sure that they would admire very much the ingenuity with which it had been put together from the very small actual remains which there were. The remains were pieced up with it, but they were so very small that it was really quite a feat to have put together the capital in the way that had been done. Dr. Murray, in passing, had used one expression which recalled to him an idea he had often heard before. He spoke about the Late Roman coins, and said they were more valuable in regard to what they showed than to what they omitted. Now, in looking at coins for the light they were able to throw upon ancient architecture, it was extremely important to remember what the medallist put in was, in fact, all that was of any value; what he omitted need not be considered, for this reason: a man engraving a building upon a coin—for instance, a man putting the Temple of Ephesus on an Ephesian coin—desired to make it recognisable, and he did so as far as he could within the limits of his space, and the possibilities of engraving on a small scale. Therefore, whatever they found on the ancient coin they might be certain there was some reason for. What a man left out might be to save himself trouble. Any feature to be found in an ancient coin professing to represent a building of a certain city was almost overwhelming proof that something of that sort was there; because otherwise the man who made the coin would never have given himself the trouble to put it in. That, he thought, was sometimes a little forgotten in estimating the value of evidence from ancient coins. One other remark he wanted to make. It was not quite correct to say that Mr. Wood was never misled. Mr. Wood showed wonderful pertinacity and perseverance, and never knew when he was beaten; but the fact was that he looked for the Temple for six years on the wrong side of the city, although the literary evidence that it was on the other side was quite accessible.

Mr. Phené Spiers said that Sir Henry Howorth's remarks reminded him of what happened at the British Museum on one occasion when he was there with Dr. Murray. The late Mr. Watkiss Lloyd then came up and asked, "Is there any new German theory?" At that time these German theories were coming over about once a week.

The President said he had listened with the greatest delight to the amount of information given in the paper, and to the extremely clear way in which it had been given to them by Dr. Murray. He had not himself particularly studied this Temple, and there was very little that he could communicate on the subject. He had been at Ephesus, but only for two or three hours, and for a particular purpose, though he was even then able in the time to demolish one of the grounds which Fergusson offered to support his theory of the nine columns. Fergusson said was obvious there must have been nine columns, because from that side there was a hill which entirely hindered the possibility of a view of the Temple. He did not remember exactly the words, but that was the gist of the argument. Now, it so happened that there was no hill at all, near enough to interfere with the view of the Temple. There was, indeed, Mr. Wood's excavation mound—his "spoil-bank," so to speak—which, when one was down at the bottom of the diggings, where ponds now occupied the place of these excavations, one might be hindered from looking east and west; but there was nothing of the nature of a hill, when the ground was clear; so that the question of the nine columns could not rest in any way upon the nature of the site. He was not quite sure that he agreed with Sir Henry Howorth, but he would say little on that point, because no doubt Dr. Murray would take care of himself. He did not see that it was necessary for Crœsus to put his name on a conspicuous place, but he might have been glad to place it where the square base hindered the ordinary sightseer from noticing it.

The vote of thanks was then put, and carried by acclamation.

Dr. Murray, in reply, thanked the meeting for the very cordial reception they had given his paper. He valued highly the opinion of architects, and indeed owed very much, in the course of his professional work, to such men as Professor Aitchison for their advice and encouragement, and also to some of the younger men, whom he saw so frequently in the Museum. It was a great change to go through the galleries on a Saturday afternoon, and find quite a crowd of the younger men, drawing and measuring there; he did not remember such a thing a few years ago. Mr. Middleton had asked about the Corinthian Capital. He had not had time to work it up at all. but he did not see that it necessarily belonged to the Temple. Mr. Wood had found it on the site, but to what building it had belonged he (the speaker) could not at all guess. He was afraid he could not answer Sir Henry Howorth, but he would not like to see statues put on the tops of those square pedestals. Sir Henry Howorth had touched on several points, and he thought he would have to read his paper over to that gentleman privately. What Mr. Statham had said about coins was very true and just, but it was also possible that a coin of Hadrian or Antoninus Pius, showing the front of the Temple at Ephesus, might have been struck in Rome or Alexandria, and taken not so much directly from the Temple by some one who knew it, as from some of the numerous shrines of Diana, which were sold to pilgrims, so that a great many liberties might have been taken with the original Temple.

Colonel Prendergast wished to know who had executed the beautiful drawings he saw exhibited on the screens.

The President replied that these drawings had been submitted by the probationers who had passed the Intermediate Examination, and had been exhibited so as to show specially what work the students could do in the provinces. The three sets of drawings had been produced by Mr. F. M. Harvey, Gorleston, Great Yarmouth, Mr. Harold Busbridge, Plumstead, Kent, and last, but not least worthy of notice, by Mr. Samuel Chesney, Stourbridge.

The President also announced that, on December 2 next, a business meeting would be held for the election of candidates for membership.

The proceedings then terminated.

ELECTRIC-LIGHTING REGULATIONS.

THE Conference opened last Tuesday at the Westminster Town Hall by Sir Courtenay Boyle to consider the revised regulations for the supply of electric light (of which a long report appeared in the *Times* of Wednesday and Thursday), has been very successful. On the first day alone they had reached the discussion of Clause 27, notwithstanding the fact that Supply Companies were well represented. The principal discussion was on the meaning of high-pressure and low-pressure. Mr. Crompton, the President of the Institution of Electrical Engineers, and others, urged that the low-pressure limit should be increased to 600 volts; whilst Mr. Musgrave Heaphy, speaking from the fire insurance point of view, and Earl Russell as electrical engineer to the London County Council, much preferred the 300 volt limit. Dr. Hopkinson pointed out that at Manchester the pressure between the outer mains on the fine-wire system was 450 volts, and that in no single instance had trouble resulted. He thus admitted, as was pointed out by the Chairman, that at Manchester they had been infringing the Board of Trade Regulations.

Major Cardew, speaking on behalf of the Board of Trade, made a very able reply to the attacks on the definition of pressure in the draft regulations. He said that numerous accidents which had already occurred proved that if they increased the pressure they would considerably add to the risk. He also reminded them that the demand for a higher limit of pressure came only from the Supply Companies, and he doubted whether any educated consumer would recognise the great advantage conferred by the introduction of 200 volt-lamps. We were surprised to see that several electricians recommended that no distinction should be made between direct and alternating current supply—a suggestion obviously made on behalf of alternating current supply companies, it being common knowledge that an alternating pressure is much more likely to break down insulation, and produces much more severe shocks, than a direct pressure of the same effective voltage. Mr. Gay, on behalf of the Islington Vestry, opposed clause 27—namely:—

"All conduits, pipes or casings used as receptacles for electric lines shall be constructed of durable material, and of ample strength to prevent damage from heavy traffic, and where they are laid in streets in which gas-mains are also laid, shall be so constructed as to prevent any influx of gas from the adjacent soil."

Mr. Preece, who followed, also objected to this clause, pointing out that in London alone there were 16,000 street-boxes in connexion with the electrical system of the Post-office, and notwithstanding all precautions it was impossible to keep gas out of them. Sir Courtenay Boyle stated that he would recommend the Board of Trade to accept a clause in place of this one, merely imposing upon undertakers the obligation of taking reasonable means to prevent the influx and accumulation of gas in boxes, and to give notice to the gas companies whenever an accumulation of gas therein was discovered.

At Wednesday's meeting the vexed question as to what constituted "street-boxes" arose, and, after some discussion the chairman suggested that the clause relating to the ventilation of street-boxes should apply only to those containing transformers. Mr. Hammond made the very sensible suggestion that the standard fixed for the insulation resistance of the wiring in a building should be 75 megohms divided by the number of lamps in the building. Anyone who has had any experience of the extraordinary rules about insulation given by the supply companies in London alone, hardly any two of which agree in their standard, will see the advantages to be gained by adopting a uniform standard. The Chairman promised to frame a regulation upon this basis, reserving for further consideration the particular standard to be adopted. At the conclusion of the meeting a very hearty vote of thanks was passed to Sir Courtenay Boyle, who, whilst he avoids advising the Board of Trade in the direction of grandmotherly legislation, takes the greatest pains to secure the comfort and safety of the public by throwing the responsibility on the proper persons.

DISCHARGED PRISONERS' AID SOCIETY, GLASGOW.

THE philanthropic, and at the same time valuable, work of this Society, which has been carried on for many years in very unsuitable premises of a more or less temporary nature, will shortly be continued under more favourable circumstances in the new building on the east side of Cathedral-square, which is being erected from designs of Messrs. Campbell Douglas & Morrison, architects, Glasgow.

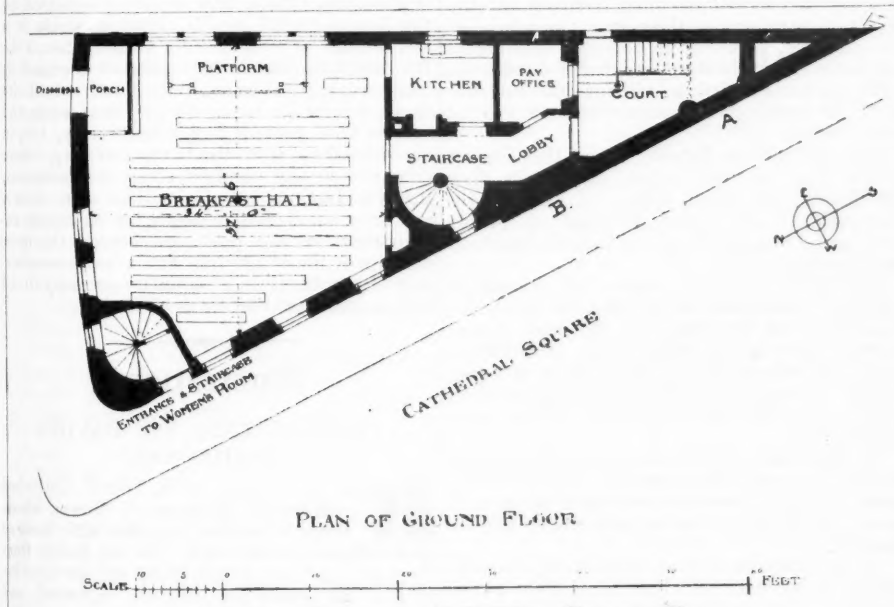
The situation is in many ways convenient, being quite near the gate of Duke-street Prison, from which prisoners from long or short sentences are discharged every day except Sunday.

The style adopted is the Scottish of the seventeenth century, which is well-suited to the domestic character of the building, and is in harmony with what one finds in the older parts of Glasgow.

The site is peculiar, being a long triangle whose sides are each fully twice the length of the base, the latter at the same time following the curve of John Knox-street. The view we give shows the principal front, which faces Cathedral-square, and the south truncated end, which forms the north side of the entrance court, as may be seen from the ground-floor plan annexed. The ground falls about 8 ft. from the right-hand point round the two fronts to the dismissal porch.

As we give the plan of the ground floor, which

Discharged Prisoners' Aid Building, Glasgow. Messrs. Campbell Douglas & Morrison, Architects.



Discharged Prisoners' Aid Builaing, Glasgow.—Plan.

is thus in part a basement floor, it cannot show the entrances at A and B, which are at the street level at the highest point.

Men who are discharged arrive from the prison, and enter by the gateway at A, and descend a stair in the court, pass through the lobby, and past the staircase to the breakfast-hall, which can accommodate 100 persons. Women enter by the door at the left-hand corner of the building, and go up a stair to a similar but smaller room on the first floor.

The stair leading to the administrative department is entered at the place marked B on plan, and leads to the Superintendent's room and offices, while in the upper floor a dormitory is provided, under the superintendence of the caretaker, for a few of the more deserving men who have gained the confidence of those carrying on this enterprise.

The building will cost fully 3,000*l.* exclusive o site.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on the 15th inst., the President, Mr. William Henman, delivered an address, in the course of which he entered at some length into the consideration of the relations of the provincial societies and provincial architects with the Institute. Referring in the first instance to the representation of the members of allied societies at the Institute Council, Mr. Henman said that as their representative he had attended three meetings of the Council of the Institute, but had not met on any of these occasions any other representative of a provincial society, though there were eight who were members of the Council. This was not as it should be, and though he would willingly testify to the able and business-like manner in which the work of the Council was conducted by many of the leading metropolitan architects, his experience of both London and country practice had convinced him that if the influence of the R.I.B.A. was to be properly extended throughout the whole kingdom, much greater consideration must be given to the views, feelings, and requirements of those who had to reside as well as to practise in the provinces, because in several particulars their work had to be carried on under conditions different from those which existed in London. Referring to the remarks in Mr. Penrose's recent address at the Institute, on the falling off of the number of Fellows joining the Institute, Mr. Henman observed that the statistics given by Mr. Penrose* were somewhat startling, and continued—

"By further investigation of the lists in the Royal Institute of British Architects' 'Kalendar' for the current Session I find there are about 300 Fellows and 500 Associates (many of the latter eligible for election as Fellows) all resident in London and its neighbourhood, as against about 250 Fellows and 360 Associates residing in the provinces, the remainder being in the Colonies, &c.

Now it appears to me evident that if the roll of Fellows is to be largely increased from outside it must be chiefly from the provinces. If such be so, I know full well that if the gates be opened and country practitioners are invited to enter, the question will on all sides be asked: In what can membership of the Royal Institute of British Architects benefit us? And from personal knowledge I may add that many believe that as now constituted no good to them would result.

As I do not myself hold that view in its entirety, yet, from evidence around me, I cannot shut my eyes or ears to its frequent reiteration. I propose, with all due deference, to give some reasons why I believe it has become so firmly rooted, and to offer a suggestion or two in the hope that those more competent than myself to deal with the details of the subject may take it up, and bring forward proposals which will give confidence to many an architect who has the welfare of the profession at heart, and who, although he may not directly reap any personal advantage, will yet join its ranks in the belief that both in the metropolis and throughout the country, unity of action and motive will tend to the advancement and appreciation of our art, secure greater happiness,

* See *Builder* of November 9, pages 332, 333.

comfort, and convenience for the public, and ultimately benefit its votaries.

At the risk of it being supposed I take a mercenary view of the subject, I mention first the question of £ s. d. The country architect who takes any interest at all in his profession except as a vocation for mere money-making joins the local society, and probably pays his guinea or more subscription plus entrance-fee. He may also be a member of the London Architectural Association, and, if still more loyal to the profession, be Associate or Fellow of the Royal Institute of British Architects. In this way his annual subscriptions to architectural societies alone amount probably to double what they would be if he resided in London or the neighbourhood, although the privileges he acquires are small, and of those he can avail himself incomparably less.

The return of one-fourth of the subscription of membership from the Institute to the allied society does not relieve the individual.

I lay no great stress, however, upon this matter of subscriptions, because I believe that anyone of standing in the profession would willingly pay them, but to some it is a consideration; and, from a business point of view, they are entitled to ask what they will get for their money?

Well, let us see. An excellent publication—"The Institute Journal"—regularly delivered, but the principal contents of which anyone may read in the professional papers.* Then there is the right of attending the general meetings in London, and of voting on matters then brought forward; but how rarely are such attendances possible? And, should he be elected President of an allied society, he may have a seat on the Council of the Institute.

I have already alluded to the scanty attendance of provincial members at the Council Board. No doubt the difficulty of finding time, to say nothing of the expense, is considerable, but what is the result? Why, that the interests of non-metropolitan members are neglected. To give an instance of the way they are overlooked: at one of the meetings I attended, the appointment of a Competitions Committee was to be made; some eleven names were suggested, all metropolitan; but when I drew attention to that fact, and pointed out that by far the majority of competitions were for buildings to be erected in the provinces, the Presidents of three allied societies were added to the list, showing clearly a willingness to consider the claims of country members when duly advanced.

Let it not be supposed for a moment that what I have thus drawn attention to is in any way intended to be antagonistic to the interests of the Institute: from my earliest days—my father having been a member almost from its foundation—it has been a household word to me, and I was even taught to look forward to the day and consider it an honour, when I should myself become a Fellow; but, the statistics brought forward by Mr. Penrose, and the necessity there is for, not only maintaining the number, but largely increasing the list of Fellows, have induced me to point out somewhat plainly why it is I consider that many able architects, practising outside the metropolitan area, stand aloof.

In addition to which, no doubt, a serious blow to the accession of Fellows from outside was dealt when, by the petty action of a few newly-fledged Fellows and Associates, such men as our respected member and past-President, Mr. J. A. Cossins, were refused admission—men who, although unconnected with the Institute, had done good work in the profession long before their objectors were architecturally born—while at the same time others were elected whose principal claim was that they had slipped into being Associates without the necessity, as now, of passing the examinations.

The published lists of the allied Societies indicate that the senior members number 587, of whom only 149 are Fellows of the Royal Institute of British Architects, and 100 Associates. Yet in the majority of cases only those who have been in practice some years can be admitted to that Senior class. Consequently, as only seven years in practice is necessary to qualify for Fellowship of the Institute, the majority would, on that score, be eligible; but in addition to senior members of local societies, there are many able architects practising in the country who have neither joined the local society nor the Institute.

Take our own district; there are in the Birmingham Architectural Association forty-one senior members, of whom thirty-eight have offices in Birmingham; but only four of that number are Fellows of the Institute, yet the names and addresses of about 120 architects are given in the Birmingham Directory alone, while our district comprises the five counties of Staffordshire, Shropshire, Warwickshire, Worcestershire, and Herefordshire.

The question arises, Cannot something be done to bring some at least of this large number of practising architects within the ranks of the Institute?

I have read through its charter and by-laws, and find that according to Clause 76 'Branches of the Royal Institute may be established according to regulations to be made from time to time by the Council.' Yet throughout the 'Kalendar' there is no other reference to any 'Branch.'

The suggestion, therefore, which I have to make and commend to the favourable consideration of the Institute, yourselves, and all the allied Societies, has reference to the formation of such 'Branches' of the Royal Institute of British Architects in the larger cities and towns throughout the country, to take the place of the existing allied Societies with a view, not only of strengthening the Institute itself, but, in addition, to give greater vitality, influence, and scope for usefulness to the local Architectural Societies, by binding all together in one corporate body.

Although I am not prepared with a cut-and-dried scheme for bringing about such an Imperial federation of architects, I suggest that the Institute should, as proposed by Mr. Penrose, first obtain the necessary powers to enable architects, with the required qualifications, to be admitted to the class of Fellows without having to undergo the prescribed form of election at present essential, and that the Council should then enter into negotiations with the allied Societies with the object of transforming them into 'branches' of the Institute, provided an adequate number of practising architects of repute in the district are willing to become Fellows of the Royal Institute of British Architects and attach themselves to the local branch.

The branches so formed should then be all placed upon an equal footing as regards their constitution, and might consist of Fellows and Associates of the Royal Institute of British Architects, Ordinary Members and Hon. Members and Students.

Additional privileges might be granted as regards representation of the branches upon the Council of the Institute and the more special business affecting the whole body of architects might, by arrangement, be taken say at only four council meetings during the session, one of which might with advantage be held in rotation at a branch centre.

An adjustment of fees, on a more liberal basis than is at present allowed to the allied societies, could readily be made, and as much freedom of action locally as is now enjoyed might still be granted.

To encourage the attendance of local representatives at the quarterly Council meetings of the Institute a reasonable allowance for travelling expenses might be made to them.

I refrain from entering into further detail at present, but on the lines indicated the Royal Institute might be strengthened, and I feel sure it would be the means of bringing together in friendly intercourse many men having the same interests at heart, who, although now residing and practising in the same district, do not at the present time even know one another.

Having shown that in our Association there are but comparatively few members of the Royal Institute, it may be supposed that in dealing with this subject here it is somewhat out of place and does not concern you. I trust, however, you may not go away with that idea; for many of you are earnestly studying to pass the examinations in the hope of eventually entering the ranks of the Institute, and I doubt not you will appreciate the honour the more highly if you realise that it is a body of men truly representative of the architectural profession throughout the country, so that should you ultimately determine to settle down in the provinces you may rest assured that your interests will by it be safeguarded, and that you may, in connexion with your local 'branch,' render active service in its ranks.

For my part, when a society claims to be representative of a class, I have no belief in its being too exclusive, in the sense that, by its methods of election, worthy men are shut out. The state of things which has grown up in the architectural profession cannot in a day be revolutionised.

Many who have expressed their ideas respecting the constitution of the Institute appear to me to reverse the order of precedence, and seem to hold the opinion that it is the Institute which is to make the architectural profession, and that its object is to exclude from its ranks all who cannot claim personal acquaintance with some of its members. In this way a number of able men hold themselves aloof, and carry out good work, which is a standing witness that, to be an architect, it is not necessary now to be a member of the Institute.

Instead of which I am inclined to think the proper course would have been, at first, to have opened wide the gates and have admitted all who by their works could show they had made architecture a study, and had to the extent of their opportunities successfully practised the art. Then the Institute could have said, Now, representative as we are of the architectural profession, we intend, in the interests of the public and the better appreciation of our art, to admit only those to its ranks who prove that they are willing, by systematic study, properly to prepare themselves for its practice. The now mystic letters, F.R.I.B.A., would then have become familiar to the intelligent public, as are the M.D. of the physician; and the majority instead of the minority of practising architects would in consequence have connected themselves with the Institute.

Do not suppose for a moment that this would be likely to lower the standard of educational requirements which would in the future warrant the admission of those aspiring to be architects. The tendency of all democracies is ever selfish. Yet good and able men would no doubt be found to take the lead, and pronounce the *vade mecum*.

If it is proved that, under the new by-laws, the closing of the ranks of Fellow has been too precipitate, and I think that is clearly indicated by the figures quoted by Mr. Penrose, surely it is still possible to mark time for awhile; then, if the Institute is to increase its numbers and extend its usefulness and influence, it must not only invite those to enter its ranks who, by their works and actions have proved themselves worthy, but, in my estimation, it is absolutely necessary, before such will in any numbers accept the invitation, that the Institute should consider more closely and carry out more thoroughly the legitimate requirements of the profession beyond the mere confines of the Metropolis, and so make membership of the Institute a voluntary necessity to all who practise architecture as an art."

* Mr. Henman is quite mistaken here. The reports of the *discussions* at the Institute meetings are given nearly as fully in our columns as in the Institute *Journal*, but the papers read (with the exception of the President's annual address) are not given, by the wish of the Council, who retain the copyright in the papers read at the Institute; for which reason (as we have before explained) we have never given more than a short *résumé* of the Institute papers, although we have always had the full paper before us. The Institute has now definitely returned to its former system of preparing its own synopsis of the papers read, for publication in the professional journals; and the papers are only to be found in full, often with a good many valuable illustrations, in the *Journal* of the Institute. The *Journal* also contains a good many specially contributed articles, sometimes of considerable value, which are published nowhere else.—Ed.

Illustrations.

CHOIR-SCREEN, ST. DAVID'S CATHEDRAL.

THE choir-screen at St. David's Cathedral was erected by Henry de Gower, whose tomb it encloses, together with those of two unknown ecclesiastics. He was bishop from 1328 till 1347, and to him is also due the erection of the fine palace adjoining the cathedral, and other works at Swansea Castle and Lamphey Court.

These works have so strongly marked an individuality that they form a class by themselves. Whether their peculiarities of design are due to Bishop Gower, or to some artist of original genius employed by him, it is of course impossible to say.

The illustration is from a water-colour sketch by Mr. T. G. Jackson, A.R.A., exhibited this year at the Royal Academy.

COMPETITION DESIGN FOR GLASGOW ART GALLERY.

THIS illustration shows the elevation and plans of the design submitted by Mr. Jas. Lindsay in the Glasgow Art Gallery competition.

In arranging the plan it was assumed that there would not be funds sufficient for the entire completion of the scheme all at once, therefore it seemed desirable that the buildings should be divided into three sections, the central containing the large hall, with sculpture or promenade saloons, with the entrances and staircases; the western

section containing a circuit of museum galleries and courts on two floors; the eastern section containing museum and picture-galleries, also the administrative offices, and the block for the School of Art accommodation.

The central hall being intended for occasional musical performances, provision has been made for communication from north to south and east to west independent of the hall, so that the assemblies in the hall would not cause any interruption to the lines of traffic throughout the buildings.

The staircases are placed close to the north and south entrances, and are so situated that they form either a beginning or termination of the circuits on either side of the central hall.

The picture galleries are all top-lighted, as well as the museum galleries, where not lighted by side windows, and the spaces underneath the galleries which surround the larger museum courts have light from side windows and not depending on the light from main roof.

JAS. LINDSAY.

HOUSE AT SUTTON COLDFIELD.

THIS house, of which we give two illustrations, is built from the designs of Mr. Ernest Newton, the materials used being brick and hand-made tile. The contractors were Messrs. Barnsley of Birmingham.

The plan of the ground-floor is given in one of the lithographs.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Repairs to Carriageway, Victoria Embankment.—The Highways Committee reported that they had had before them a memorial from the Great Eastern Railway Company, and a letter from Lord Claud Hamilton in support thereof, pointing out that the entire closing of the carriageway of the Victoria Embankment while under repair causes great inconvenience to traffic to and from Liverpool-street Station, and asking that in future the work may be so carried out as to leave half the road available for traffic. With reference to this matter the Committee were informed that when the repairs were carried out in two longitudinal slips there was a difficulty in preserving the true form of the road and making it homogeneous throughout; and, further, that there was considerable risk of accident through the liability of horses to take fright at the noise and steam from the road-rollers, the use of which is an imperative necessity in repairing the road. They therefore thought it unadvisable to adopt the course suggested in the memorial, and they recommended—

"That Lord Claud Hamilton, Chairman of the Great Eastern Railway Company, be informed of the reasons for the entire closing of the Victoria Embankment carriageway when under repair, and that, having regard to these reasons, the Council regrets to be unable to accede to the request contained in the memorial of the company."

Sir J. Blundell Maple, M.P., moved to omit the words "regrets to be unable to," and insert in their place the words "will, as far as possible."

Colonel Rotton seconded.

Mr. N. W. Hubbard, Chairman of the Committee, said that the work was done in sections last time. It was the intervention of the Works Committee which stopped the system of repairing half the road at a time, because of the danger to life and limb. He hoped the Council would not pass the amendment, but that it would give the Committee an instruction which should absolve them from responsibility.

On a division the amendment was defeated, 46 voting for and 60 against.

Mr. Boulnois then moved to refer the matter back, which was seconded by Major Probyn, and was agreed to, Mr. Burns, in the course of some remarks, expressing the hope that the Embankment would be paved with wood before long.

Churchyard Bottom Wood, Highgate—The recommendation of the Parks Committee that the Hornsey Urban District Council be informed that the Council was advised that it had no legal power to contribute towards the purchase of Churchyard Bottom Wood was adopted.

The Works Committee and the Cost of Works.—The Works Committee reported the cost of twenty-seven works they had carried out during the past six months. It was stated that the total of the estimates was 122,561*l.* 6s. 7d., and the actual cost 119,166*l.* 13s. 3d., showing a saving of 3,394*l.* 13s. 4d. While the actual cost of jobbing works had been 3,503*l.* 0s. 3d., the "value at schedule prices" had been given at 3,879*l.* 15s. 9d., so under this head there was a further saving, which amounted to 376*l.* 15s. 6d. Adding together the two favourable balances, and deducting the deficit reported in May on the sixty-two works previously undertaken, it would be seen that the "net profit" made by the committee was 1,049*l.* 16s. 10d.

Sir John Lubbock, M.P., said it was true that the figures showed a small profit, but the Council should remember that when the work was given to contractors the cost generally worked out at 6 per cent. below the estimate. Assuming that this would have been the case with these eighty-nine jobs, the work would have been done for 18,000*l.* less than the Works Committee had carried it out for.

Mr. Ward, Chairman of the Committee, said that the saving of 6 per cent. was on the original estimates, but if they took the revised estimates they would see that 10 per cent. was put down for extras, so that instead of a saving of 6 per cent. there had been really a loss of 4 per cent.

On the motion of Mr. Cohen, M.P., the debate was adjourned.

The new Lunatic Asylum, Bexley.—The Asylums Committee reported as follows, in reference to the new Lunatic Asylum for Bexley Heath:—

"We have had before us the designs of the new Heath Asylum, Bexley, prepared by the architect, Mr. Hine, under the instructions of the special sub-committee appointed by us for the purpose. The plan of the main building is designed on the continuous principle combined with villas, and the asylum will be built near the northern boundary of the estate to the east of the present lodge. The principal entrance is in the centre of the north side of the building, and this block provides committee-room, office accommodation for medical officers, clerical staff, &c. Occupying the centre building to the south of the entrance block are the steward's stores, kitchens, recreation-hall, dispensary, and rooms for the principal officers, including a separate block for the assistant medical officers. Flanking the administrative offices on each side are the blocks for nurses and attendants, and in the rear of these are blocks for 120 working patients on each side, conveniently placed for the laundry or workshops. On either side of the administrative centre are the wards for the patients, the females on the west side and males on the east. The greater part of these are disposed on the south side of the main corridor, each side of which is formed into a quarter circle, the blocks being stepped back to obtain the greatest amount of sunshine and prospect; they are arranged in a continuous series, so that the officers can go their rounds without having to retrace their steps or traverse any of the main corridors. Part of the main corridor is widened out and arranged in recesses for use as visiting rooms, a direct approach to each being obtained by separate visitors' entrances on each side of the building. The laundry and workshop buildings occupy the remainder of the north frontage each side of the entrance block. All the traffic, therefore, of visitors, stores, and coal will be confined to the north side, and will leave the whole of the east, south, and west sides of the building entirely to the patients. The patients' blocks are all two stories high, and are divided into wards as follows:—Infirm, 224 females, 224 males; acute, 276 females, 226 males; epileptic, 180 females, 120 males; chronics and working, 300 females, 295 males; total, 980 females, 865 males. The main building will thus provide for 1,845 patients, and in addition there are provided one villa for 35 farm workers on the male side, two villas, each for 35 women, and a special hospital villa for 50 women, making a total of 1,100 women and 900 men. These villas will stand by themselves in the grounds adjacent to the main building. A chapel of sufficient size will be erected as a detached building on the north side of the asylum and within easy distance of it. We should have preferred this to have been attached to the building, but in deference to the wish of the Commissioners in Lunacy it is placed as it is. An isolation hospital is provided to be erected near the north-east corner of the site, and the mortuary to the rear of the chapel. The old mansion-house is, with some small alterations, to be adapted for the medical superintendent's residence. A house for the steward is provided near the entrance, and a new lodge opposite the present one for the engineer. All engineering works, comprising heating, ventilation, water-supply, lighting, and laundry and kitchen machinery, are provided for and included in the cost of the buildings. In addition to the above-named buildings, which are all indicated on the plans, there will be required farm-buildings with a suitable house for the bailiff, which the architect has to design when their requirements are determined, and are included in the amount of his commission. The architect has drawn our attention to the Council's present form of contract, and has expressed an opinion that if tenders be invited on the existing conditions the number received will probably be very limited, and the prices high in consequence. We have communicated these views to the General Purposes Sub-Committee who we understand have the question of the form of contract under their consideration. Most careful attention has been given to the plans which have been prepared with regard to strict economy combined with efficiency and modern requirements. It is necessary before a reliable estimate of cost can be submitted to have working drawings prepared and bills of quantities taken out, but we think it probable that the amount sanctioned by the Council for the provision of the Asylum, viz., 350,000*l.* (exclusive of site and equipment), may be exceeded in consequence of the larger proportion of accommodation for special cases which we have thought it necessary to provide, having regard to the class of patients we have lately been receiving. If, however, the conditions of contract be modified sufficiently to attract competition, we are of opinion that the excess of cost, if any, will be slight. We are of opinion that, under all the circumstances, the plans we now present are in every respect suitable for the purpose. We desire to emphasise the serious necessity of this asylum being built with the least possible delay, and we have accordingly approved the plans, and instructed the architect to at once proceed with the detail drawings for the approval of the Home Secretary. We recommend that our action be approved."

Mr. Burns said that any attempt, in erecting such a building, to keep below what he might call the Claybury standard for an asylum, would be a penny-wise-and-pound-foolish attempt.

Mr. McDougall, Chairman of the Committee, said he believed they would be able to build the asylum for 100,000*l.* less than what Claybury cost. There were already enough patients to fill the building, and the Committee were looking out for the site of another.

The report was then agreed to.

Action of Frost on Iron and Steel.—On the recommendation of the Bridges Committee it was agreed that, subject to an estimate being submitted to the Council by the Finance Committee as required by the statute, the Bridges Committee be authorised to conduct a series of experiments to ascertain the action of frost upon iron and steel, at an estimated cost of 100*l.*, and that the cost be charged as an extra upon the Blackwall Tunnel contract.

Proposed Cable across Waterloo Bridge.—The same Committee recommended granting permission to the National Telephone Company to lay a cable across Waterloo Bridge. The Company proposed to fix a $2\frac{1}{2}$-in. cable upon the east cornice of the bridge, and within a segmental galvanised-iron casing, 9 in. in width at the base by $5\frac{1}{2}$ in. in height. The Committee said so large a casing would probably interfere with the architectural lines of the structure, and were of opinion that the Company should be restricted to the use of a 3-in. tube.

Mr. Roberts moved that the recommendation should be referred back, because it would desecrate the appearance of the finest bridge they had.

Dr. Longstaff seconded the amendment, remarking that he thought there were many other ways in which to get the cable across the river without using Waterloo Bridge—one of the finest monuments they had. There was a bridge not far from Waterloo Bridge whose appearance it would be impossible to spoil.

The recommendation was withdrawn.

Result of Legal Proceedings—Party-walls at Coburg-row, Westminster.—The report of the Building Act Committee contained the following paragraph, the recommendation being agreed to:—

"By our direction the Solicitor assisted the District Surveyor in police-court proceedings in support of his notice of objection, under Section 159 of the London Building Act, 1894, with reference to the party-walls in a warehouse building belonging to the Army and Navy Auxiliary Stores in Coburg-row, Westminster, the question involved being whether a wall can be 'party' as to some of its height and 'external' as to the remainder. In a similar case which arose early this year under the Act of 1855, and in which the Council took the view that the wall was a party-wall throughout, this point was decided against the Council, with 10*l.* 10s. costs; and when the case now referred to came before the Magistrate he followed the previous decision, and overruled the notice of objection, awarding the defendant twenty guineas costs, but stating that if no appeal were made he would, on application by the Council, reduce the costs to an amount near to that in the previous case. We are of opinion that, for the guidance of District Surveyors in the execution of their duties, an autho-

ritative decision should be obtained upon this very important question. We therefore recommend—

'That the Solicitor do take the necessary measures for obtaining a decision of the High Court upon the point whether under the London Building Act, 1894, a wall, which is admittedly a party-wall so far as it separates a building or buildings, can be deemed to be, for any portion of its height, an external wall.'"

The Council adjourned soon after 7 o'clock.

COMPETITIONS.

EAST RIDING LUNATIC ASYLUM.—On the 18th inst. the Visiting Committee of this Asylum, Beverley, adopted the report of their professional referee, Mr. G. T. Hine, and awarded the three premiums in this competition as follows, viz.: — 1st, 50*l.*, "Ebor," Mr. C. H. Hebblethwaite, Hopwood Hall, Halifax; 2nd, 25*l.*, "Star," Messrs. H. Crisp and Oatley and W. S. Skinner, 27, Clare-street, Bristol; 3rd, 10*l.*, "Labor Omnia Vincit," Mr. Hy. Harper, Tavistock Chambers, Nottingham. The assessor in his report said that "the designs, which comprise twenty sets, including alternative ones, are on the whole very creditable, and show that much care and consideration have been given in their preparation."

ARCHITECTURAL SOCIETIES.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING SOCIETY.—A meeting of this Society was held in the Lecture Theatre, Tullie House, on Monday last, when Mr. Percy Fitzgerald, F.S.A., delivered a lecture before a large audience on "Robert Adam and his Architecture."

NORTHERN ARCHITECTURAL ASSOCIATION.—The winter session of the Northern Architectural Association was inaugurated on the 13th inst., in the meeting-room of the Art Gallery, Newcastle. The President (Mr. Jos. Oswald) delivered his annual address. He reviewed the work, excursions, &c., of the last session, and said:—The opportunities afforded by this Association for such visits to ancient and modern typical works, made in company with those who are best able to describe and appreciate them, together with our winter sessional meetings, at which valuable papers are read and discussed, and our library steadily growing in importance, naturally attract to our ranks an increasing number of members. I note that our present strength is 140, being fourteen more than a year ago. The Association continues to offer bi-annually prizes to students and the younger Associates, for measured drawings and sketches from old work, done during the summer months, and for designs and other testimonies of study more adapted for winter exercise. It must not be overlooked, however, that our Association has within the scope of its operations other affairs than those I have yet referred to. These may, perhaps, be termed "internal," as affecting only, or chiefly, its members, old and young. But there are matters which may be called "external," as they affect the relationships between our profession and the public in general, or sections of it, such as the various building trades in particular. Having alluded to cases in which the Association had been called in to settle trade disputes, and having also referred to ancient companies, the President proceeded:—"One thing most noteworthy is, that in each and every company, stringent regulations were in force as to the taking and training of apprentices; the tendency in those days being apparently to excess in the number of them, calling for restrictive measures. In concluding my address to you last year, I ventured to call urgent attention to the tendency, in our own times, towards the opposite extreme. I feel sure that, from no other cause have the building trades in this country suffered so much during the last quarter of a century as from this. It is, for obvious reasons, difficult for a private individual to obtain trustworthy statistics as to any particular district in this respect, but it is certainly within the experience of all that the general standard of work has been, and is being, lowered in consequence of the decay of the old system of apprenticeship, and the absence, as yet, of any efficient substitute for it. To my mind, the solution of the difficulty lies largely in the hands of the trade unions. These powerful organisations have hitherto dealt chiefly with the financial relationships between employers and employed, but I trust, in this so-called enlightened age, the equally important relationship between the workman and the general public will be recognised by these unions." After referring to architects of the past and their work, the President continued:—It is surprising to note how, during the present century, the number of professional architects has multiplied, and that they all can find employment. They exist in accordance with a public demand, and what the public requires nowadays in the architect is, not an artist only or chiefly, but a man of business. The competition system has undoubtedly come to stay. The evils of the system exist, but can be ameliorated. Much has been done by the Institute and the allied Societies in that direction already, but more remains behind. In conclusion, the President spoke of the Institute, and the Association's representation thereon. Mr. W. H. Knowles moved a vote of thanks to the President for his address. The Hon. Secretary (Mr. A. B. Plummer) seconded. The motion was carried by acclamation, and the proceedings then concluded.

GLASGOW ARCHITECTURAL ASSOCIATION.—A lecture was delivered on Tuesday evening, in the rooms, by Mr. Percy Fitzgerald, M.A., F.S.A., London, on "The Work of Robert Adam, Architect," illustrated by seventy slides. The President was in the chair. At the close of the lecture, which has now been delivered at most of the architectural centres in England and Scotland, Mr. Fitzgerald was, on the motion of Mr. Campbell Douglas, seconded by Mr. T. L. Watson, awarded a hearty vote of thanks.

GLASGOW SCHOOL OF ART.—The President of the Glasgow Architectural Association (Mr. A. N. Paterson, M.A., A.R.I.B.A.) is the special lecturer on architecture this year at the Glasgow School of Art. His subject is "Domestic Architecture," in six lectures, illustrated by lime-light views. This is the third year of these lectures.

Books.

Architectural Engineering, with special reference to High Building Construction; including many examples of Chicago Office Buildings. By J. K. FREITAG, B.S., C.E. New York, John Wiley & Sons: London, Chapman & Hall. 1895.

FOR anyone who is practically interested in the erection of lofty piles of office buildings, such as those which are especially in fashion at Chicago, this is a very useful book; and it must be interesting to all architects from the information and experience which it gives in regard to certain methods of construction, though we are certainly not desirous of seeing the type of building with which it deals popularised in England. The whole system is one the object of which is in fact purely commercial, as is very frankly admitted in a sentence on page 47—

"Several gangs of men may frequently be seen at different levels on a single front of a building, and laying pressed brick by electric light was even tried on the Ashland Block, Chicago, in an endeavour to complete the building by May 1; and the intention was to make up for this extra expense of night work by time gained through leases signed earlier than would otherwise have been possible."

Cleverness in construction may no doubt be provided by such conditions, but good building in the best sense of the word cannot be. In fact, the whole problem considered in the book is that of getting up a building as fast as possible, and to as great a height as possible, consistently with immediate safety. "Thus, on the Manhattan building, the main cornice of terra-cotta was completed before the wall was built up beneath it. On the Unity building the granite base-wall was being built at the first and second stories, the pressed brick face was being placed at the twelfth floor level, while the hollow-tile arches were being set for the fifteenth floor—all at the same time."

The manner in which the work is designed seems in keeping with the whole thing. The architect does not trouble himself much as to the steel framing, which is put into the hands of an engineer, and the engineer furnishes details only of connexions and special points in the framing, leaving the rest to the contractor. In fact, the buildings seem to get themselves up on a kind of automatic system. Under these circumstances it is not surprising to meet with statements which show that, however cleverly these buildings are practically put up, their theoretical stability is provided for in a very haphazard manner. There are buildings, we are told, from ten to sixteen stories high in the City of Chicago, that possess absolutely no metallic sway-bracing; and others scarcely better, where sway-rods, as wind-laterals, were attached to pins through lugs on the cast columns, which lugs were of an ultimate strength of, perhaps, 25 per cent. of the rods. This is probably in the cases where the enclosing walls are thick and solid, as it is then considered that any pressure which could bring the steel bracing into action would have damaged the walls before the bracing could be brought into action; and in that case the introduction of bracing for resistance to wind-pressure is a mere kind of structural superstition. There are other cases where the walls are a mere veneer, and where the steel bracing is a real factor of safety.

The author devotes a chapter to skeleton construction, followed by chapters on floors and floor framing, exterior walls, columns, wind bracing, partitions and foundations. In the course of the chapter on floors it is stated that American experience has led the writer to the opinion that soft tile or porous terra-cotta is much better fire-resisting material for the covering of the steel-work than hard tiles. "Johnson's patent flat arch," made of hard terra-cotta with thinner webs than ordinary, was at its first introduction exceedingly popular as a floor, and it was used in a number of the best buildings in Chicago; but a test by fire and water of hard tile blocks occurred some time ago in the rear of the Schiller Theatre building (we do not quite gather whether it was or was not an artificial testing), in which it was found that the blocks cracked to such an extent as to fall from the metal-work in large quantities. Soft or porous terra-cotta has been specified for many of the latest buildings, including the New York Life Insurance and the Fort Dearborn buildings.

In the chapter on Exterior Walls we are told that the recognition of the merely protective veneer character of the wall has gone so far that the terra-cotta companies design their pieces with special reference to tying them on to or suspending them to the framework, and "the terra-cotta arches, which to the casual observer seem to carry some heavy wall or pier above, prove to be made of hollow clay blocks, held by wires or clamps to the concealed beams or girders which really support the roofs." A more unarchitectural system of construction it seems difficult to imagine; and whatever care may be taken at the outset to secure the stability of the structure, one would be prepared to find that such a building must carry in it the seeds of decay and disunion, and that under such a system "building for eternity," in the good old phrase, is a thing of the past. The manner in which immediate convenience is preferred before considerations of structural stability is indicated in the fact that, in the Columbus building at Chicago, built two years ago, a square hole was cut in the bedplates of all the super-imposed columns which carried the successive floors, in order to utilise the central space for carrying pipes up. This seems a little too much for the author, who admits that "such a cutting of the bed-plates cannot be too severely condemned"; not to speak of course of the fact that the pipes so placed cannot by any possibility be got at!

The chapter on Foundations contains some very interesting descriptions and sections of various methods of forming foundations for these very lofty buildings, some of which are admirable in themselves, considered as wall-bases, but appear nevertheless to be quite unsuited to the nature of the soil which forms the building base at Chicago. The soil underlying the city consists of a soft loam or quicksand 12 or 14 ft. thick, under which is blue clay, resting on limestone-rock from 40 to 80 ft. below the surface. The clay is estimated to bear 1½ to 2 tons per square foot; but settlement is so universally looked for that every building is designed as for from 3 to 5 in. above its ultimate level. To pile, or form concrete piers, down to the rock, is considered too costly, and the Post Office and Custom House at Chicago were built in 1877 on a bed of concrete 3·6 thick, on the clay. Some parts of the building were extraordinarily heavy, others very light, and settlement has ensued to such an extent that the building is now known as "the ruin"; it has settled in some places nearly 24 inches. Failing the penetration to the rock, all foundations are designed in precise proportion to the load which they will have to carry, which of course is the logical process in any case. As the author observes, examples have been known, in Chicago and elsewhere, of light piers alternating with heavy ones being crushed through the mere fact of having too good a foundation for the weight on them, and failing to join in the general settlement. The employment of caissons sunk to the rock is mentioned in some cases; but for the most part there appears to be a lighthearted manner of building these enormously high buildings on the clay and allowing

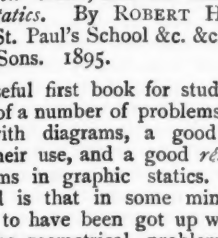
for settlement, which, again, is as much at variance with the idea of monumental architecture as the steel framing and veneer of the building itself. Those however in this country who wish to study "how the thing is done" in the States, or at all events in Chicago, the paradise of tall buildings, will find Mr. Freitag's book of interest, and it contains some valuable statistics of various kinds.

Note-Book on Plane Geometrical Drawing; with a chapter on Scales, and an Introduction to Graphic Statics. By ROBERT HARRIS, Art Master at St. Paul's School &c. &c. London: G. Bell & Sons. 1895.

THIS is a useful first book for students, giving the working of a number of problems in practical geometry, with diagrams, a good account of scales and their use, and a good *résumé* of the main problems in graphic statics. The only fault we find is that in some minor details it hardly seems to have been got up with sufficient care. In the geometrical problems the same figure is in many cases made available for several problems, not always stated on the same page as the diagram, which also may contain features some of which are necessary only to a portion of the problems. In such case the matter would have been simplified to a young student by placing in brackets after each problem the number of the diagram referred to (the diagrams are numbered separately from the problems). On the first reference to the finding of proportionals there is no definition of "proportionals," and it can hardly be assumed that a student necessarily knows what is meant when he is told to "find a fourth proportional to the lines A B, C D, and E F." A student's book should explain itself. In Problem 128 we find "this ordinate B E is a mean between" &c. The word "ordinate" has not as far as we can see been used before in the book, and it is not in the list of "definitions," any more than "proportional," or "harmonic proportion." The student must therefore be dependent on another book for the meaning of these words. As a pretty long list of definitions is given at the beginning, one cannot see why these should have been omitted from it. There is some carelessness of wording in other points. In the third problem, "From 1, with radius C 1, set off on the arc 1, 2, the points 3, 4," is wrongly expressed, as the diagram shows; the direction should be "from 1 with the radius C1, set off on the arc 1, 2, the point 3; and from 3, with the same radius, set off on the same arc the point 4." In Problem 135 a point H is referred to which is not shown on the diagram; no doubt any sharp student would see where it should be, but all students are not sharp.

Are there not some venerable bits of pedantry in geometrical teaching that ought to be buried? Why should a student be told that to divide a straight line into equal parts he is to draw another line at any convenient angle to it and divide that line into equal parts, and draw parallel lines from the equi-distant points on A C to cut A B? Surely the natural reflection of the student is, why not divide A B into equal parts at once, instead of going round about to divide A C first? Or take the following, problem 125 in the book under notice:—

"In a given square to inscribe the largest possible isosceles triangle having a given base.



Let A B C D be the given square. Draw the diagonal A C. From A set off A E, equal to the base of the required triangle. Bisect A E by a line at right-angles, intersecting A B and A D in points F and G. The triangle F C G is the one required."

Taking an isosceles triangle the apex of which coincides with one angle of the square, it was surely hardly worth while to make a "problem" of the self-evident fact that the largest such triangle on a given base must be one of which the centre or "altitude" line coincides with the diagonal of the square. Another point to be noted is that the proposition here is "to inscribe an isosceles triangle in a square," while if the student looks in the list of definitions he will read that one rectilineal figure is said to be "inscribed" within another "when each angular point of the former figure lies *upon a side of the latter*;" so that this self-evident isosceles triangle is after all not "inscribed" in the geometrical sense of the word, or at all events not in accordance with the definition given by the author.

Stress Diagrams. By W. H. BIDDER. London: Gale & Polden. 1895.

NO one who has had any experience of the methods usually adopted for computing the stresses in engineering structures could doubt, after reading Mr. Bidder's book, that its author is thoroughly conversant with his subject. He writes in an enthusiastic manner, and it is easy to perceive he is actuated by a love of his profession. He has the impression that it is the duty of someone to point out the errors contained in various works that have from time to time been published on the subject which he has made his special study, but unfortunately a thorough acquaintance with any department of science is no guarantee that those possessing such have also the necessary ability to instruct others.

To an author of a simple text-book an exhaustive knowledge of his subject is often detrimental, since it frequently debars him from seeing the difficulties that present themselves in the same light as they are regarded by the student to whom he desires to explain them.

It is hardly possible to overrate the importance of writing books of this character in a clear and simple style so that there can never be any doubt as to what the author really means to say. It is not, of course, essential that they should be written with absolute grammatical accuracy, but they should at least approach this standard or perfection within measurable distance. Either Mr. Bidder is not of this opinion, or his eagerness to point out the mistakes of others has rendered him callous as to the language he employs in his own pages. Consequently a useful little treatise is considerably marred, either through not sufficient pains being bestowed upon its preparation, or owing to its author's ideas of our language not being precisely those to which one is accustomed.

Notwithstanding this, however, the book contains a good deal of really useful information. Various methods of ascertaining the stresses on different kinds of lattice girders are given, and are applied, by way of illustration, to such structures as the new Tay Bridge, the single-line railway bridge over the Spey at Elgin, which has a clear span of 360 ft., and others.

The author also explains how to ascertain the stresses in continuous girders, suspension bridges, and arches, under all practical conditions of loading, and describes how a rivetted joint should be designed, besides alluding to several other important matters of detail.

It will be seen therefore that the book covers a wide field, and the subjects with which it deals are throughout treated in a much more practical manner than generally is the case in works of this character, and this alone is sufficient to recommend it to a large number of those interested in designing bridge-work.

The Law Relating to Building. By His Honour Judge EMDEN, assisted by H. JOHNSTON, Barrister. Third Edition. London: Knight & Co. 1895.

JUDGE EMDEN has acted wisely in compressing this work in size: it now consists of 690 pages as against 947 pages in the second edition. On the other hand, the paper and print are not so good as they were in previous editions. There is little to be said of this edition, since the previous issues have received full notice at our hands. We may repeat that this is a full and comprehensive work, wanting in some respects even yet in compression. It would have been the better, too, for a less wholesale quoting of cases in the notes, and a little more care not to put the word "supra" after a decision which is printed in full on a previous page, and not on the page on which this word appears. We have also some doubt whether it was desirable to print in this volume the London Building Act, 1894, which has been the subject of separate works. This book relates rather to the general law in relation to buildings, such as the relations between the architect and his employer. The person who desires to possess such a work, and is not concerned with London buildings, may well hesitate to purchase a book which contains a number of pages occupied by statutes relating only to London. But even with certain drawbacks, there is no doubt that this book is a complete storehouse of the law relating to buildings, and, though clumsy in form, contains a great quantity of useful material more useful to the lawyer, as it is presented in this book, than to the layman.

Archæologia Oxioniensis. Part VI. Oxford: 116, High-street. London: Henry Frowde.

THE Oxford Archæologia increases in size and interest as its proceeds. The sixth number contains an account, with an illustration, of a very interesting piece of carving of the thirteenth century, a spandrel, believed to have been part of the base of the shrine of St. Frideswide. An article on the architecture of the Bodleian Library gives some letters of Sir Thomas Bodley, which indicate that he was to some extent directing the work himself: for example—

"I pray you send me by your next Monday carrier how many foot you find between the wall of the Divinity School just by the door, and the wall without next the gate. Likewise between the side wall of the School and the wall that does compass the School next to the Town wall. Take your measure from the wall of the School, and not from the Buttresses."

In another letter—

"I am sorry for Bennett, whose skill I shall want in many respects. But yet my trust is in Bolton, that he will make it good, bearing as he doth so good a report, of sufficiency in his joinery. I pray you send me word, how soon you think it will be, before they finish all, to the end,* I may take order with the painters to begin."

There is an order, too, as to the doors to the library, Sir Thomas thinking it "an exorbitant request" to have a door made towards Exeter College, when there was already a door at the west end of the library. But it all does not seem to amount to more than that he ordered how the walls were to stand or where there was to be a door. For the detail of the work he seems to have trusted to "Bolton" and others.

National Art Library, South Kensington: Classed Catalogue of Printed Books. *Ceramics.*

WE should have said "classified" catalogue, but the "Department" never uses the English of ordinary mortals. The present is the first of a series of such catalogues which are to be issued, with the view of enabling every reader to ascertain with the least possible trouble what works the Art Library contains on any particular branch of art. In addition to the titles of books and pamphlets specially relating to the subject, these catalogues will contain the titles of others which incidentally illustrate it, with a reference to the page or plate to which attention should be directed.

Such catalogues will be of the greatest service to students, and save them a great deal of time and trouble. We only wish the British Museum would attempt something of the same kind.

Correspondence.

To the Editor of THE BUILDER.

PROPOSED ASSOCIATION OF WATER-WORKS' ENGINEERS.

SIR,—We are again reminded by that useful directory published by Messrs. Hazell, Watson, & Viney, that "there is no institution wholly given up to water engineering questions in England, although such questions are occasionally treated of by the Institution of Civil Engineers." That is, I am led to understand, the opinion of many engineers, managers, and others interested in waterworks undertakings. The exceptional and severe winter of 1894-5 itself was a subject-lesson to those interested in waterworks. The controversy between the use of two-gallon and three-gallon cisterns for water-closet purposes, the question of employment of registered plumbers only for waterworks purposes, the better control of fittings for the prevention of waste, misuse, and the contamination of public supplies, are points amongst others which might usefully engage the attention and call for combined action from those engaged in this important branch of engineering.

My object in writing is to initiate a discussion from those interested, with a view of ascertaining what support is likely to be given to such an association. D. M. F. GASKIN, *Engineer.*

Nottingham Corporation Waterworks,
Engineer's Department,
November 16, 1895.

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* The punctuation seems to be given as in the original letters.

The Student's Column.

METALS USED IN BUILDING.—XXI.

DURABILITY.

THE action of the weather on metals is widely different to that on stone or wood, though the effects may often appear to be somewhat similar. There are so many different kinds of metals and they are called upon to fulfil such a variety of functions that it is impossible to adequately discuss, in the scope of a series of articles like the present, their behaviour under all circumstances. We can only go into the matter on general lines.

A metal that is insufficiently supplied with oxygen, or whose nature it is to absorb that element on every convenient occasion, is usually a most perishable substance unless it is suitably protected. The commonest of all metals—cast and wrought iron and steel—are specially prone to succumb to atmospheric influences, owing to the great affinity iron has for oxygen. The production of iron-rust and scaling is the result. The process of decay may be arrested or facilitated, as the case may be, according to the composition and excellence of manufacture of the iron and steel, and the situation and conditions in which the metals are placed. In a humid atmosphere, or under water, such metals are placed to the worst advantage—the drier the air the better, provided it is fairly pure and not too much impregnated with deleterious acids tending to corrode. The composition of the water is all important, and the conditions as to temperature are leading factors.

It is generally stated that the quantity of rain annually falling in a district may in some measure be taken to indicate the potential energy of the weather with respect to metals in such district. Now, although that is within certain limits perfectly correct as applied to building stones, it must only be taken to apply to metals to a very slight extent. The rainfall of a district is measured directly by means of a gauge attached to the receptable into which the rain falls, the proportion falling over a wide area being estimated therefrom. But, suppose the whole of the year's rain were to fall in, say, sixty days instead of being spread more evenly over the year, we could allow a fall of 100 inches in the former case, and that would not do so much damage to unprotected iron as would twenty-five inches in the latter. In reality, it is not so much the amount of directly measurable rain that constitutes the important factor, as the prevalence of dew. The most work is accomplished when the surface of the metal is continually kept moist, and dew cannot be placed in the same category as rain. The corroding power of the dew and rain is enormously increased near the sea-board.

By way of illustration, it may be remarked that the telegraph wires on some lines seem unaffected by twenty years' exposure; whilst in other situations the total renewal of the wires has become necessary on the expiration of three or four years—and that with the same material. The varying durability of galvanised zinc roofs in different localities is well known. The life of most metals, as previously remarked, depends chiefly on the resistance they offer to combination with oxygen, and thus their decay may be regarded as a slow combustion. Their durability further depends on the character of the oxide formed on their surface.

Wrought-iron in a pure, dry atmosphere suffers practically no deterioration; it is also extremely durable in distilled water free from air as far as possible; but it is slowly oxidised in a humid atmosphere, and with fatal rapidity in air or water containing free acids. It may, however, be efficiently protected from agents of destruction by paint of good quality, which adheres to clean iron with great tenacity. It is also a remarkable fact that its oxidation appears to be to a great extent arrested by vibration. Plates are more durable when united in large masses than when isolated. A singular instance of this occurred during the construction of the Britannia Bridge, as placed on record by Mr. Edwin Clark.* A heap of plates was left two years on the platform, where they became so corroded that they could be literally swept away with a broom; whilst precisely similar plates, employed in the construction of the tubes alongside, suffered no deterioration. From the foregoing it is evident that the painting of exposed wrought-iron girders and roofs, more especially in the neighbourhood of smoky towns, is a precaution of the utmost importance. Every care should be taken to leave no unnecessary hollows where rain-water could collect, to avoid contact with damp earth, and especially with vegetation, and to use the material as far as possible in the form of heavy bars rather than thin plates.

In reference to iron-work for hot climates great care should be exercised in seeing that the surface of the iron is perfectly dry at the time of painting it. If this is not attended to, the high temperature and the moist state of the hold of the average vessel carrying such cargo tends to form rust underneath the paint; the latter rises in blisters, then bursts, and falls off in large flakes, exposing the bare iron, highly oxidised, without a vestige of the paint remaining. It is better, perhaps, not to paint iron-girders and the like for export in view of the difficulties adverted to; for it only entails expense in scraping the whole off, and commencing afresh.

In regard to the common practice of employing iron for structural purposes under water, it may be noted that on cast-iron being exposed to the action of sea-water it slowly decomposes; the iron being dissolved, leaving graphitic substances behind. The action, however, is superficial and very slow, and cast-iron piers have been built in the estuary of the Thames that have successfully resisted corrosive action for half-a-century and more. No doubt the action to a large extent depends on the quality of the iron. It is advisable to give a slight increase in thickness to plates used under water. In fresh water, cast-iron is not much affected.

We may now describe some experiments carried out by Mr. David Phillips, C.E., on the effects of various kinds of liquids, hot and cold, on iron, and the best means of preserving it under such conditions from corrosion.*

The first series of experiments were conducted to show the effects on iron of various kinds of liquids, ranging in temperature daily, from that due to the atmosphere indoors, to the boiling-point. It was ascertained that hot fresh water acts less injuriously on iron than does hot sea-water; that the smaller the proportion of sea-water, and the less frequently the water, fresh or salt, was changed, the less does the iron suffer from corrosion. On iron being coated with zinc, it was found that the zinc affords no protection in pure fresh-water, but in fresh water, with one-thirtieth of its volume of sea-water added weekly, it does afford protection to the iron; and that in fresh water mixed with about one-fourth of the proportion of chloride of sodium (common salt), sulphuric acid and chloride of magnesium contained in sea-water, zinc properly attached also protects iron, as well as in sea-water; but with this difference, that it is necessary, in order to prevent corrosion, to change the liquids every three months. Experiment showed further that chloride of sodium, even when double the quantity of that in sea-water was present in fresh water, neither acted on the iron nor assisted the zinc.

The second series of experiments had in view the effects on iron of various kinds of cold liquids indoors, and the best means of preserving it under such conditions from corrosion. With boiled distilled water in the open air, the corrosion was even and general, except at the ends, where it was much less severe, and in places scarcely affected. With rain the effects were similar, though not so severe, but with sea-water the corrosion was spread all over the surface of the iron, and crystals of the metal showed bright and sparkling. On sea-water, not in open air, being employed, the iron became slightly etched. The author gives much useful information on the action of other forms of water, and the loss in weight of each plate dealt with during a period extending over five years.

In dealing with the effects of small pieces of metals and other substances in contact with iron, or in its proximity, in cold sea-water Mr. Phillips found, amongst other things, that copper attached to a copper stay on iron became severely corroded, especially the top end round the stay, where the ferruginous metal was decayed into a groove one-third round the nut on each side.

In sea-water an iron structure often commences to decay round a nut or bolt. Considerable difference of opinion exists as to the relative durability of wrought and cast iron in the sea. Small wrought-iron rods have been known to withstand decay very well; these were about 1¼ inch in diameter, standing ten or twelve feet out of the sand, and extended two miles from the shore into the sea, being frequently subjected to the action of heavy breakers. In this, and in other cases that might be cited, it would appear that a film or "fur" formed upon the iron when it was round, but when there were square edges, a polished surface, from abrasion of the metal, continually recurred, and fresh coatings of rust were formed, so that in time the angulate bars perished.

The growth of animal and vegetable matter on iron structures in sea-water may promote decay or tend to preserve, depending on the class of organism or plant concerned. As an illustration, we may quote the observations of Mr. G. O. Mann* with reference to a bridge at the mouth of the river Ibura, in Brazil. At the time of the inspection the tide was very low, the bed of the river being nearly dry, so that the pipe-piles could be examined down to the sand. The whole of these were densely covered with oysters from six inches to one foot in thickness, and the first ones had adhered so firmly to the piles, that on breaking the shells with a hammer, portions had to be chiselled from the iron to remove them. The piles were found to be perfectly sound; and it was clearly demonstrated that the shells in reality acted as preservatives to the metal by excluding both the air and sea-water.

In the case just mentioned the organism was a bivalve, the soft parts of which were never probably brought into contact with the iron, so that the active acids promoted by the animals were never directly applied to its surface. It is tolerably clear that with certain univalve shells that crawl over the surface and congregate in myriads a certain amount of destructive action is brought about.

Whilst dealing with the durability of ironwork, though not altogether connected with atmospheric decay, we may briefly notice the recommendations of the Berlin Architects' Society.† To arrive at the probable duration of iron structures that body advised that observations should be systematically made, and amongst other things they should embrace the following:—1. Measurement of permanent deflection of parts of the iron structure; 2. Measurement of deflection under a load; 3. Enumeration of constructional pieces and rivets already repaired; 4. Examination of any existing looseness of the connexions at points of junction; and 5. Examination of the paint and any existing rusted places. Other, but special, observations were suggested, and it was added that (*a*) for each structure a special observation-book should be drawn up; (*b*) the general observations (1—5) should be repeated quinquennially, and the special once a year; (*c*) all observations, where possible, should be made by the same individual; (*d*) repairs to important parts of the structure, and the soundness of the material, as well as of the connexions, should be carefully inspected.

GENERAL BUILDING NEWS.

RESTORATION OF THE PARISH CHURCH, GREAT TOLLER, DORSETSHIRE.—The parish church of Great Toller has recently undergone restoration. It was decided, on the recommendation of the architect, Mr. G. Gordon, London, to place the restoration of the old oak roof, or if found necessary the construction of a new one, in the hands of Mr. E. J. Wright, of London, who has since constructed a new oak roof (the old one having been found to be quite beyond repair). The work, as completed, consists in the removal of the south and west galleries and the opening up of the tower-arch, previously, like almost every other portion of the church, plastered over; the removal of the plaster from all the walls, these being now pointed with cement; the opening up of the old vestry arch, said by many to be of Saxon date; the relaying of the floor; the construction of an entirely new roof to nave and south aisle in wainscot oak; the erection of arcades on a central shaft of Ham Hill stone to support the roof; the construction of a new pitch-pine loft in tower, reached by a spiral iron staircase, and having an open tracery of ironwork spanning the tower arch; the replacement of the decayed flooring of tower, the removal of the west door to its original position; the overhauling of the exterior of the tower, replacing decayed stone with new, &c.; the placing of the ancient window, formerly in the east end of the chancel, to a position near the pulpit on the north side of nave; new seats throughout the church in pitch-pine; new oak choir-stalls and prayer-desk in chancel, and a new oak pulpit. The church has also been fitted with new lamps, supplied by Mr. Cox, Bridport. All the woodwork was executed by Mr. E. J. Wright, under the supervision of his foreman, Mr. Lee. The masonry was carried out by Mr. Thomas Legge. The new lead roof was supplied and worked by Mr. C. Cox, of Maiden Newton.

PREMISES, HIGH-STREET, KENSINGTON.—Messrs. John Barker & Co., Limited, are rebuilding

* "Min. Proc. Inst. C.E.," Vol. xxvii. (1868), p. 559.

* Consult "Min. Proc. Inst. C.E.," Vol. lxxxv. (1886), p. 295.

* "Min. Proc. Inst. C.E.," Vol. xxiv. (1865), p. 6.

† "Mittheilungen des Sächsischen Ingenieur und Architekten Vereins," 1880, p. 145.

a large portion of their premises butting on to Ball-street. Mr. F. G. Vigor has prepared the drawings, and the company are carrying out all the work with their own staff, with the exception of the fireproof floors, which are being constructed by Messrs. Mark Fawcett & Co. on the Mark Fawcett system.

STAFFORD COUNTY COUNCIL BUILDINGS.—In our account of this work in our issue of November 16, we omitted to mention that the marble work in the building was supplied by Messrs. J. & E. Goad, of Plymouth.

SCHOOLS, FARNHAM.—The second of the new schools built for the Farnham School Board was opened at Badshot Lea on the 9th inst. by Messrs. A. W. Chapman. The building is planned to accommodate 268 children. The elevation is of red sand-faced brick to the height of 4 ft. 6 in., and above this it is finished with rough cast; a feature in the design is a tower at the angle, the site being a corner one. The architect is Mr. Paxton H. Watson, of London and Farnham; the contractor is Mr. G. Kemp, of Aldershot, and Mr. J. Church is clerk of works.

BOARD SCHOOL, WEDNESFIELD.—On Monday a new Board School was opened at Wednesfield. The new schools, which have been erected on a site facing the Neachell-road, near the Midland Railway Station, consist of a one-story block of building, having a mixed department, with schoolroom 48 ft. by 22 ft., and two class-rooms 24 ft. 8 in. by 24 ft. 6 in. and 25 ft. 3 in. by 20 ft. respectively, providing accommodation for 200 children. Also an infant school and class-room for 100, making the total accommodation 300. The walls are of local red bricks, with terra-cotta dressings to the doorways and main gables. The floors are boarded, and the roofs are covered with Broseley tiles. The rooms are heated with open fireplaces. The general contract has been carried out by Mr. Thomas Tildesley, builder, of Willenhall, at a cost of about 2,200*l.*; the terra-cotta was supplied by Mr. Dennis, of Ruabon; the wrought-iron gates, railings, and gas fittings have been made by Messrs. Brawn, of Birmingham; and the desks and furniture by Messrs. Fisher & Son, of West Bromwich, and the whole has been under the personal supervision of Mr. T. H. Fleeming, architect, of Wolverhampton, whose design was selected in a competition by Mr. Robson, architect to the Education Department, who was appointed assessor.

CHURCH, BAMBER BRIDGE, LANCASHIRE.—On the 19th inst., the Bishop of Manchester (Dr. Moorhouse) consecrated the church of St. Aidan, Bamber Bridge. The erected portion of the church has been built at an outlay of about 4,000*l.* It consists of chancel, north and south transepts, and side chapel, the two easternmost bays of nave, organ-chamber, and choir and clergy vestries, the west end having been left for future extension. The church, when complete, will consist of a wide and lofty nave, with side arcades, the aisles being used as passages only. The transepts are of good size, and the north chancel aisle is arranged as a chapel, the vestries and organ-chamber being placed on the south side of the chancel. The chancel is large and is well raised above the nave. The roofs have internal waggon-shaped ceilings, boarded, and with moulded ribs. The windows have traceried heads, and are filled with cathedral glass of varied tints in geometrical designs. Externally, the building has been faced with Yorkshire stone parpoints, red Rainhill stone being used for all dressed work. The roofs are covered with north-country green slates, with red ridges, and the gable over chancel arch is surmounted by a bell turret. Internally, the walls generally are faced with red brick, but those to chancel are plastered. The woodwork throughout is of pitch-pine unvarnished. The portions now erected provide seating accommodation for 450 worshippers, which number will be increased to 800 when the church is completed. The style adopted is Late Decorated Gothic, and the building has been carried out from the designs, and under the superintendence, of Mr. R. Knill Freeman, of Bolton and Manchester, whose design was selected in open competition. The contractors for the work were Messrs. Moore Brothers, of Rawtenstall; and Mr. J. Yates, of Bamber Bridge, has acted as clerk of works. The heating has been carried out by Mr. Metcalf, heating engineer, of Preston, and the lead-glazing by Messrs. Walmsley & Company, also of Preston.

ALMSHOUSES, WETHERSFIELD, ESSEX.—Some new almshouses have just been erected at Wethersfield, near Braintree, Essex. The site is in the main street of the village. The buildings consist of a range of four houses. The style of the buildings is Elizabethan, the facings being in red brick with stepped gables and tiled roofs. The bays are constructed of half timber work and have oak mullioned windows glazed in pattern leadwork. The verandah is supported by circular wood columns, rising from panelled stone pedestals. Mr. Alfred Brown, of Braintree, was the builder, and Mr. E. F. Bisshopp, of Ipswich, was the architect.

PARISH-ROOM, IPSWICH.—A new parish-room has been erected adjacent to St. Michael's Church, Ipswich. The site of the new buildings is at the south-east end of the church. The accommodation comprises a parish-room 30 ft. square, with scullery attached, and entrances with vestibules from Upper Orwell-street and Bond-street, and a clergy vestry with door into the chancel. The parish-room has a height of 18 ft., with flat ceiling, divided by beams formed by the casings to the tie beams of the roof, with large octagonal inner light, which, with three large windows in the east wall, gives light. The floor is of wood blocks, and there is a platform at one end. The heating is performed by Musgrave stoves. The architecture is a form of Queen Anne. The whole of the work has been carried out from designs and under the supervision of Mr. E. F. Bisshopp, by Mr. William Grayston, builder.

SANITARY AND ENGINEERING NEWS.

THE EAST MOLESEY DRAINAGE AND SEWAGE DISPOSAL WORKS.—On Saturday last, Mr. W. G. Garland, the Chairman of the East Molesey Drainage Committee, opened the East Molesey Drainage and Sewage Disposal Works. The East Molesey Drainage Scheme, which is now completed, was prepared by Mr. J. C. Melliss some thirteen years ago. It was not, however, until the year 1889, that any practical steps were taken in connexion with it. Many difficulties were met with, especially those raised by some of the Metropolitan water companies whose intakes are at West Molesey, and whose large water mains traverse the principal roads of East Molesey. This opposition was mainly with a view of protecting the Metropolitan water-supply from any risk of contamination, other difficulties were raised by some of the landowners, whose property had to be crossed by sewers and air mains. The East Molesey scheme embodies all modern improvements up to date, and includes land for filtration of the effluent water after chemical treatment. East Molesey is situated on the south or Surrey side of the river Thames, near to Hampton Court, and is traversed by the rivers Mole and Ember, which flow into the Thames. It has an area of 781 acres, with a present population of 5,000 persons, which until the present works were carried out had no other means of drainage than the old, obsolete and dangerous cesspool system. The subsoil of the district is a water-bearing sand and gravel similar to that usually found in the lower Thames Valley, and below which, at a depth of about twenty to thirty feet, occurs the London clay. The sewers are for the most part laid in the sand and gravel, where great quantities of water were met with, and in a few places only are they laid in the London clay. The total length of sewers and drains which have been constructed is 17,027 yards, or nearly ten miles, and include the following:—12,418 yards of public sewers, varying in size from nine to fifteen inches in diameter. These sewers are constructed partly of stoneware pipes with Portland cement concrete, and partly with cast-iron pipes, the latter being employed for about a mile and a half, where very wet and treacherous ground, as well as crossings under rivers, rendered it advisable; 1,122 yards of stoneware pipe and Portland cement concrete culvert, eighteen inches in diameter, for conveyance of the filtered water from the disposal works to the River Ember; 3,487 yards of 6-in. diameter branch drains laid from the public sewers up to the front boundary of each house, together with a large number of extra junctions on the sewers for future buildings. The whole of the stoneware sewers and house-drains and culvert are constructed of pipes with modern patent water-tight joints; "Hassall's deep-socket single line" and "Doulton's composite pipes" having been employed throughout. None of the old-fashioned and now obsolete jointed pipes were used, and all the stoneware pipe sewers, with the exception of a few shallow lengths, have been strengthened by the addition of Portland cement concrete. The cast-iron pipes used for sewers all have turned and bored tightly-fitting joints. In order to secure water-tight sewers, the whole of the sewer work has been tested in sections during construction and before being covered in, by filling each section with water under pressure. The system also includes about 120 manholes and lamp and inspection-holes, also arrangements for flushing and for ventilation. There are also two underground chambers provided with Shone's patent ejectors for intermediate lifts of sewage from some of the lowest parts of the district, in one case the lift being 9 ft. and in the other 18 ft. These ejectors lift the sewage into the high level sewers, and it then all gravitates to the pumping-station at the disposal works. The disposal works include the following:—1. A screening-chamber and apparatus for removal of large matter from the sewage. 2. A pumping-station, where the sewage is lifted 39 ft. by means of two sets of plunger pumps fitted with "Ökes'" patent valves, each set of pumps capable of lifting 22,000 gallons per hour, space being provided for additional pumps when required in the future. 3. An engine-house, containing two 10 nominal h.-p. "Marshall's" horizontal steam-engines, air-compressing engine and receiver, fresh water pumps, &c. 4. A boiler-house, with two boilers, for supplying steam, made by Messrs. Galloway, of Manchester, and space for an additional boiler when required in the future. 5. A press-house, containing one of Messrs. S. H. Johnson & Co.'s 3 ft. square 30-chamber sludge-presses, with all necessary appliances for pressing sludge, including lifting and forcing rams, sludge-pits, liming apparatus, tip-truck, tramway, &c. 6. Coal-store, chemical-stores, mixing-vats, workmen's day-room, manager's office, fresh water-well, with steam-pump and overhead water-tanks in connexion therewith. 7. Three precipitation-tanks, containing together 270,000 gallons. 8. Eight acres of land, which have been suitably underdrained for filtration of the effluent water, which then passes by a culvert and is discharged into the River Ember. The chemical treatment will be similar to that already in use at Richmond and many other places, the salts of alumina and iron, together with a little carbon and a little lime, being dissolved in vats by means of water agitated by compressed air and then added to the sewage previous to its entering the precipitation-tanks. The supernatent water from the precipitation-tanks will be filtered through the land, which is of suitable quality, being of a sandy loam overlying gravel, and is underdrained to a depth of about 6 ft. The land will be used intermittently. The precipitate or sludge, which will gravitate from the tanks to a small underground chamber, will be limed and then pressed into a portable form. The air for working the Shone's Ejectors is compressed at the disposal works, and conveyed in one case a distance of 2,300 yds., and in the other a distance of 2,500 yds. to the ejector-chambers. These ejectors have been supplied and erected by Messrs. Hughes & Lancaster, of Ruabon and Westminster. The machinery throughout is provided in duplicate, so that the free flow of sewge and its purification will not be delayed at any time in case of temporary breakdown. The sewers and such parts of the works as cannot easily be enlarged or added to are calculated and constructed to serve a future population of 15 000 persons. The disposal works which can be added to and enlarged without difficulty are calculated and constructed to deal with 50 per cent. more than the present population, or 7,500 persons. The scheme throughout is designed on the principle of excluding all rainfall and sub-soil water from the sewers and house-drains. The undertaking has been carried out in two contracts. The sewers, pumping station, tanks, buildings, &c., have been executed by Messrs. B. Cooke & Co., of Phœnix Wharf, Battersea, S.W., the amount of their contract being 24,300*l.*; and the machinery has been carried out by Messrs. Markham & Co., of Chesterfield, the amount of their contract being 3,985*l.*

PORTLAND WATER SUPPLY.—The engineer, Mr. Ernest J. Elford, writes to us in regard to recent reports as to the bad quality of the Portland water supply, that the analyses of the water from the new well for upwards of a year gave the utmost satisfaction, and that it was only quite recently, after a prolonged period of heavy pumping, that salt water found its way into the well. Mr. Elford prepared a detailed report on the subject for the Urban District Council of the manor of Portland which he has forwarded to us. From this report it appears that in 1871 the Local Government Board pressed on the Portland Board of Health the urgent necessity of securing a better supply of water, but nothing was done till 1889, when the South Well scheme was carried out, with the result above noticed. In the course of the Report it is mentioned that the Medical Directors General of both the Admiralty and War Department had condemned the use of Portland water for the troops and shipping, on account of the uncertainty of its quality. The objection to the water was not that it was always impure, or even generally impure, but that owing to the nature of the surroundings of the supply and of the strata through which it passes, it was rendered so liable to contamination that it must always be looked upon with suspicion. The Report confirms this opinion. Taking, as an instance, the well in Easton-square, a few minutes after a sharp shower the water was found to be in appearance much like milk. This was caused by the stone dust from the quarries; but was it not reasonable, says the engineer—nay, probable—that with such direct communication between the surface and the well as was proved by this fact to exist, other contamination might and did take place? Within a short distance were vaults and cesspools which had not been emptied for ten, twenty, thirty, and even more years. Could they be justified in recommending the use of a source of this kind for a permanent public supply? Apart even from the questions of quantity, cost, and quality, they had to face yet another consideration, viz., What would be the attitude of the Local Government Board towards the idea of a supply of this kind? The engineer thought they must all admit that it would be most unfavourable, and that they would probably place every obstacle possible in the way if an attempt should be made to carry out such a scheme. Another idea, which found many supporters among the inhabitants of the Island, was the one of utilising in some way—either by sinking a large number of wells or by driving headings—the water from the Verne. The cost of this would be great, and both quantity and quality of water uncertain. Neither would it be advisable to bore deeper still, as this would necessitate boring right through the coral rag and Oxford clay (estimated to be about 350 ft. thick) into the cornbrash and forest marble, a total depth of probably 1,000 ft. Even then it would be doubtful whether they would obtain a satisfactory supply. Looking at the matter, therefore, all round, the

engineer could not recommend any source of supply upon the Island. He had come to the conclusion that the most available and satisfactory source of supply was one which was suggested some years ago—viz., the Portisham Spring. The chief advantages of this source were as follows:—(1) No experimental works would be required, the spring being an entirely natural formation. (2) The quality was no doubt excellent, as the water came direct from the chalk, and was entirely outside the influence of any possible contamination. (3) The level at which it could be obtained was such that the water would gravitate to such a height as to supply a very large portion ot the Underhill District without any pumping; this would mean not only a reduction in the first cost, but also in the working expenses. (4) It would be less costly, taking everything into consideration, than any other. The cost of the whole scheme — including a supply-main from Portisham capable of delivering with the head available 300,000 gallons per 24 hours to a height of about 220 ft. above sea-level, engines, engine-house, reservoir, and distributing-main complete—would, he estimated, amount to about 21,000*l.*, to which must be added an amount for compensation and law expenses, placed at 6,000*l.*, making a total of 27,000*l.* This amount for compensation would probably be much in excess of what they would have to pay, considering the very small use to which the water was at present put. The Portland Urban District Council have provisionally adopted this scheme, and have instructed their Clerk and the Engineer to take the necessary preliminary steps towards carrying it out.

SEWAGE WORKS, ALTON, HANTS.—A Local Government Board inquiry was held at Alton, Hants, on the 19th inst., by Col. Coke, M. Inst. C.E., for the purpose of considering an appllication from the Urban District Council for a loan of about 11,000*l.* for sewage disposal works, the plans of which had been prepared by Messrs. R. B. Grantham & Son, Northumberland Avenue. The inspector first examined the land up to and upon which the sewage was to be pumped and distributed, and then held the inquiry. There was a good deal of opposition to the application.

ARBROATH WATER SUPPLY.—At a meeting of Arbroath Burgh Commissioners on the 19th inst., it was resolved to extend the underground water supply of the town by sinking a new well in the lands of Warslap, and connecting it by means of an adit passing through the water-bearing gravel-bed with the wells and pumping-station at Nolt Loan. The adit connecting the wells will be about a quarter of a mile long. It was resolved to engage the services of Mr. M'Culloch, of Messrs. A. & R. M'Culloch, C.E., Edinburgh, and Messrs. M'Culloch & Jamieson, C.E., Dundee, in advising the Board in the carrying out of the work.

FOREIGN AND COLONIAL.

FRANCE.—The special Railway Committee on means of transport for the Exhibition of 1900 has decided on the formation of a railway line from the Esplanade des Invalides to Versailles. The journey will occupy about twenty minutes.——An interesting exhibition of water-colours and drawings by M. Hervier has been arranged at 20, Rue Laffitte, which will be open till December 12.——The Municipal Council of Paris has decided against the adoption of M. Teulière's scheme for metal footbridges over the streets.——The monument to Emile Augier the poet was inaugurated last Sunday at the Place de l'Odéon. The stele which supports the bust is connected with the pedestal by a bronze seat on which is seated a woman in rich Renaissance costume, personifying the Clorinde of "L'Aventurière." She turns towards a figure symbolising Comedy, who is engraving the name of Augier on the stele. Behind the monument is a small genius or child leaning against a mask which recalls the features of the actor Got, who was one of the principal interpreters of Augier's works. The figures, as we have previously mentioned, are the work of M. Barrias.——The heirs of the Comte de Paris have redeemed the estates of their father, notably the Château d'Eu and its domain, which represents a value of five million francs. The Château d'Amboise has been purchased by the Duc d'Aumale, who proposes to use this ancient abode of the French kings as a *maison de retraite* for veterans of the war in Africa.——A statue to Pasteur is to be erected at Melun, by public subscription.——At Vesinet, near Paris, a very large building or group of buildings was inaugurated last Sunday, combining a general post-office, schools, barracks, and municipal buildings.——A monument has been erected at Blois, a few days ago, to the memory of the historian Thierry. M. Iselin is the sculptor.——The Municipality of Neuilly-sur-Seine has opened an architectural competition for the erection of new Law Courts.——The next Congress of the Association for the Advancement of Science will be held at Tunis, from the 1st to the 4th of April, 1896, and will afford opportunity for some very interesting visits which have been arranged to localities in the neighbourhood.——A number of members of the Municipal Council of Charenton-Saint-Maurice have taken steps towards providing for the erection of a monument to Delacroix, the painter, who was born there.——Important decorative work is proposed to be carried out at sevaral of the Mairies in the outskirts of Paris, especially Issy, Suresnes, and Creteil.

GERMANY.—The picture presented by the Emperor to the Czar of Russia has now been published as an etching. The author is Herr H. Knackfuss, who worked under the Emperor's personal supervision, and if we are rightly informed, partly from a rough sketch provided by His Majesty illustrating his ideas as to the composition.——The election of Herr Kinel to be President of the Akademie für Bauwesen has been ratified. Professor Adler will be Chairman of the Architectural Section. These elections hold good until 1898.——Dresden is to have a monument to commemorate the Royal festivities of 1889, when the anniversary of the House of Weltin was celebrated. The monument will be in the form of a large bronze obelisk about 60 ft. high, with historical bas-reliefs. The design is by Messrs. Schilling & Græbener, architects, of Dresden, and the site selected is opposite the Prince's Palace.——Professor Karl Begas, of Cassel, has been awarded the first premium for the design of a monument illustrating German unity. Professor Eberlein received the second premium,——The competition for laying out the Pleissenburg site at Leipsic, to which we have referred, has been won by an architectural student, Herr Thmig. The premium was 150*l.*. and there were twenty-five candidates.——Some fine Roman mosaic work has been found at Treves, and has been restored.——Some excellent Roman mosaic work was also found at Bingen, on the Rhine, and has been sold to the Frankfort Museum.——The archæological collections of Münster, which are valued at 9,000*l.*, have been presented to the Province of Westphalia, which is founding a provincial museum.——"The History of the Steam Engine" is the subject of the new premium of the Society of German Engineers; the essay is to treat of the last fifty years, and of the progress in different countries. The premium is 500*l.*, and the essays are to be sent in by December 31, 1898.——The Berlin municipality advertises for a "director" for the city gas-works. As several municipal offices, such as the management of the waterworks, have been held by Englishmen, it may be of interest to note that the salary is 750*l.*——A new building for the electro-technical institute at Hanover has been opened.——The owners of property in the suburbs of Berlin are opposing the purchase of ground for cemeteries.——"Baurath" Hugo Licht, the city architect at Leipsic, has received a distinction from the Emperor in connexion with the ceremonies at the new Imperial Law Courts.——The Pathological Institution at Berlin, will now be temporally lighted by electricity, and the new buildings taken in hand.——Professor Roch's Bacteriological Institute which was erected some time back (and which was temporarily housed in barracks opposite the large Government hospital), will be transferred to Dahlem, where new buildings will be erected for it.——Berlin is to have a Colonial Institute, arranged on similar lines to our institution in Northumberland-avenue. Temporary premises have been taken, and a new building is soon to be erected by voluntary contributions.——The General Council of next year's National Exhibition has not approved of the recommendations of the Committee of Management with regard to lighting the galleries at night, and this decision is causing much discussion in the Press throughout Germany. Demonstrations are being held by clerks, workmen, and others, who are employed throughout the day, demanding the regular lighting of the exhibits after dark.

SWITZERLAND.—A monument in memory of the assistance given by the Swiss to the city of Strasburg during the Franco-German war has been unveiled at Basle. The monument cost 15,000*l.*, and is the gift of Baron Gruyer. Herr Bortholds is the sculptor.——The new "Tonhalle" has been opened at Zurich with some ceremony. The block is practically what we understand under the name of a people's palace, and contains several large assembly rooms, concert halls, with dining-rooms, refreshment-rooms, and suites of rooms which can be let out for private entertainment. The situation is on one of the main embankments facing the Zurich Lake, with a most beautiful aspect. Messrs. Fellner & Helmer, of Vienna, are the architects. The main hall will seat 1,500 for concerts, with an orchestra of eighty and a chorus of 350. The second hall holds 1,000, and the third about 600. The acoustic properties of the halls are considered very satisfactory.

BOMBAY AND CENTRAL INDIA RAILWAY STATION.—Mr. E. Roscoe Mullins, sculptor, has been commissioned to execute, in Bath stone, the colossal group of sculpture representing "Engineering," to be placed on the central gable of the Bombay, Baroda, and Central India Railway, Administrative Offices, Bombay, of which Mr. F. W. Stevens is the architect. Mr. Mullins has also been commissioned to execute the medallion heads of the late Colonels French and Kennedy, the pioneers of the railway company, to be placed in circular panels over the exterior arches of the central carriage porch of the building.

MISCELLANEOUS.

OAK SCREEN, ST. MATTHEW'S CHURCH, IPSWICH.—An oak screen has been presented to St. Matthew's Church, Ipswich, by Mrs. D. H. Booth in memory of her late husband. This structure, which is of light oak, has been designed by Mr. John S. Corder, of Ipswich. The screen is placed between the two imposts of the chancel-arch. It is 12 ft. 9 in. high from the chancel floor to the top of the cresting, and has a width of 14 ft. 4 in., the upper portion being wider owing to the fact that the piers of the chancel-arch spread at the top by reason of an ancient settlement. The screen is divided into seven bays or compartments, the centre one being much wider than the others and forming the doorway. The six bays flanking the doorway are filled in solid to about 3 ft. 8 in. from floor with oak panels having carved and traceried enrichments in the upper part of the panels and standing upon a solid moulded plinth. Above these panels rise moulded mullions, the four principal ones having buttresses on the two faces, and these buttresses terminate at the spring of the arches with crocketed pinnacles. The screen is carved and enriched on both sides, and every panel, spandrel, and crocket is of different design. The devices on the four shields to the chancel side are the emblems of the Crucifixion. All the angels vary in design and vesture. There are 102 different spandrels, 97 different crockets, 15 different finials, and 56 different carved cusps. The design was carried out by Mr. Fred. Bennett, builder, Ipswich, the carving being executed by Mr. John Groom.

THE MONUMENTAL BRASS SOCIETY.—This Society was reconstituted nearly two years ago out of the former "Cambridge University Association of Brass Collectors." The total number of members was 144 in June of this year. Two parts of the "Transactions," and two parts of the Portfolio, were published during the past year, and the attention of members is called to the fact that matter for the "Transactions" is urgently needed, and the editors will be glad to receive any papers, lists, or notes suitable for publication therein. An excellent list of Bedfordshire brasses continues to run through the "Transactions." It has been decided to publish the Cambridgeshire list in a similar form; considerable progress has been made in the final revision of this work, and a large number of matrices and inscriptions, omitted in the old list, have now been added.

"DICKENS'S LONDON."—A justly-merited rebuke has lately been given to one of the numerous class whose enthusiastical worship of what they call "Dickens's London" sometimes outruns discretion. A correspondent of the *Times*, having gratuitously assumed the truth of a tradition that No. 18, Took's-court, Cursitor-street, is "the identical house which Dickens had in his mind's eye" as that of Snagsby, law-stationer and writer, goes on to say: "Snagsby's house is very old, and is likely soon to be demolished; those interested should not delay in seeing it." Whereupon Mr. J. A. Langston writes thence to the *Times* representing that to his own knowledge a large sum of money has been recently expended upon the property, and adds: "As one carrying on my profession of an architect at this address, I do not want those who know me to imagine I am living in a tumbledown old structure: whether it be Dickens's Snagsby's house or not."

OPEN SPACES, LONDON.—It is stated in *Notes and Queries* that the chief officer of the Parks Department, London County Council, is engaged upon a history of Municipal Parks and Open Spaces in London. On the 5th inst. Lord Meath opened to the public Bartholomew-square, E.C., acquired by the St. Luke's Vestry, through the instrumentality of the Metropolitan Public Gardens Association, who at their last monthly meeting agreed to contribute to the purchase of the disused burial-ground at Guy's Hospital, to acquire a burial-ground in Long-lane, Bermondsey, and to improve the enclosure around St. John's Church, in Smith-square, Westminster.

OXFORD UNIVERSITY BRASS RUBBING SOCIETY.—This society has a two-fold object; during term, to complete and revise the register, first of all brasses, then of all sepulchral monuments in the county and diocese of Oxford; and, during vacation, to promote the study and preservation of brasses elsewhere, as its members may find opportunity. The society has held two ordinary meetings in each of the last three terms, at all of which recent rubbings taken by members have been exhibited. Papers have been read on "Symbolism in Brasses," by H. M. Conacher; "The Problems of a Brass Engraver," by J. W. Crowfoot; "Heraldry," by A. R. Pinel; "Canopies in Brasses," by J. L. Myres; "The Parish Church and Monuments of Minster in Sheppy," by W. H. Draper. At a public meeting held in the Ashmolean Lecture Room Viscount Dillon gave a lecture upon "Anicent Armour," and has since been elected an honorary member of the society. The President is the Rev. J. C. Cox, LL.D., F.S.A.

RESTORATION OF A CROSS, LUSCOMBE, DEVONSHIRE.—Two miles or so south-west of Totnes, in the hamlet of Luscombe and parish of Harberton, at the junction of four roads, are the fifteenth century remains of a cross. Only the base and part of the upright pillar have remained to testify to what was once there. These are hewn out of grey granite. Under the direction of Mr. W. M. Tollit, architect, of Totnes, the missing portions have now been made good. The new work is of Dartmoor granite, and on the top of the shaft is a circular head carved like that of the cross at St. Columb

Major. The restoration has been carried out by Messrs. Harry Hems & Sons, of Exeter.

THE STRAND EXPLOSION.—The inquiry into the circumstances attending the death of Fireman Sprague was resumed on Monday, at the St. Clement Danes Vestry Hall, by Mr. John Troutbeck, the Westminster Coroner.—Mr. A. O. Collard, architect, of Buckingham-street, Strand, deposed that he was instructed by Sir J. Hutton, in February, 1893, to make a survey of the houses, and made out a specification providing for every necessary repair. He had viewed the *débris* since the accident, and found that the houses were well built. The gas-main opposite No. 27 was found to be fractured. There had been a leakage from the main, and he had no doubt that the gas percolated into the basement of No. 26, where it would accumulate owing to the cellar being sealed up. That was the cause of the explosion.—Mr. Rowland Plumbe, District Surveyor of West Hampstead, gave similar evidence.—Mr. Robert Walker, District Surveyor of St. Martin's-in-the-Fields, also stated that the houses were in good condition. He was of opinion that the accident was due to an explosion caused by the gas getting into the flues. Flues in old buildings were never properly separated. In both houses all the flues were cracked.—P. Watson, a turncock in the employ of the New River Company, said that on October 24, five days before the explosion, he visited the court. The fracture in the water-pipe was about 20 ft. from that afterwards discovered in the gas-main, eighteen inches above it. There was apparently an escape of gas, and he tested the pipe with a taper all along the trench which was made. Failing to detect an escape he did not make a report to the gas company. He thought then it must be sewer gas.—Mr. George F. Foulger, chief engineer to the Gas Light and Coke Company, deposed that no complaints of an escape of gas in the court had been made before October 28. The gas-main was practically unsupported by earth, and acted as a girder to the footway above. The fracture of the gas-main was due to the falling of the building, and it had previously, in his opinion, been cracked by the washing away of the soil beneath it. He was certain that the crack was of recent date, because so serious an escape of gas as it would have permitted could not have gone on undiscovered for any length of time.—Charles Hartwell, an inspector of gas-mains, stated that he made a fourth attempt to find an escape of gas on the evening of Tuesday, about five o'clock, and found there was some leakage. He made out his report at 6.45 p.m., and shortly afterwards heard that an explosion had occurred, so that there had not been time to take remedial measures.—Sir Frederick Bramwell, past-President of the Institute of Civil Engineers, said, in reply to Mr. Lyttelton, that he had inspected the scene of the disaster, and found a considerable depression in the ground, which had existed before the fall of the houses, but which the weight of the *débris* would increase. The earth below the asphalte had been carried away, and the soil underneath the gas-pipe was charged with water and too loose to afford good support for the pipe. There had evidently been much leakage of water. He found no trace of a long-existing crack in the gas-pipe. The rust was due to the crack being exposed to the water. The gas-main was strong, well laid, and in good condition. Other evidence having been given, the jury returned a verdict of "Accidental death," but were not agreed upon a rider.

ARBITRATION, HAY.—The Hay Urban District Council are to purchase from the Hay Waterworks Company their undertaking, and by an agreement entered into between the parties the price to be paid for it, as well as the amount of compensation to be allowed to the Secretary of the Company, was referred to the arbitration of Mr. Edward Pritchard, M.Inst.C.E., of Birmingham and Westminster. The arbitration proceedings were commenced on the 15th inst. in Hay, when the arbitrator inspected the works to be acquired, and sat on Saturday to receive evidence. The proceedings were adjourned.

FOREST GATE AND UPTON PARK.—Messrs. Tuckett & Son offered by auction at the Princess Alice Hotel, Romford-road, on the 14th inst., a further portion (being their twelfth sale), of the Plashet Hall Estate, belonging to the trustees of the late John Gurney; comprising sixty-one lots in South Esk-road, which realised from 51*l.* 10s. to 71*l.* 10s. per lot, and fifteen shop lots in Red Post-lane, which made from 90*l.* 10s. to 100*l.* 10s. per lot. The whole of the seventy-six lots were sold for a total of nearly 5,000*l.*; a result showing a considerable rise in values, consequent upon the rapid development of the neighbourhood.

NEW PULLMAN VESTIBULE TRAIN.—A train of three new Pullman cars has recently commenced working on the Brighton Railway. The vestibules of these cars are larger than any previously built, and two of the cars have each a private room to seat six passengers. These rooms are finished in satin-wood, with ceilings painted and decorated in gold to match the upholstery, which is of crimson plush, with crimson silk curtains lined with gold. All the cars are fitted both for compressed oil-gas and for electric light, and are heated by means of hot-water apparatus. Electric communicators are conveniently placed throughout to enable passengers to summon the conductors when required. The cars have been constructed and finished for the Pullman Company at the works of the Brighton Railway Company at Brighton.

THE COMMISSIONERS OF SEWERS.—At the meeting of the Commissioners of Sewers held on Tuesday last a report was presented by the Streets Committee recommending the adoption of certain modifications in the plans of the Central London Railway Company and the Waterloo and City Railway Company and the rejection of other proposed modifications. The proposed modification No. 2, which would substitute the subway terminus in front of the Mansion House contemplated by the scheme of the Central London Railway for the terminus in front of the Royal Exchange which the scheme of the Waterloo and City Railway included, was recommended on the ground that it would better distribute the general traffic through the whole system of subways than the original plan. It would not affect the sewers under the control of the Commissioners, but it would involve an alteration of the levels and direction of the Walbrook sewer, which was under the control of the London County Council. Both the railway companies concurred in the proposed alteration. The modifications not accepted were Nos. 3, 4, and 5, the first of which proposed alterations at the corner of Princes-street and Mansion House-street, to avoid interfering with the vaults of the Union Bank, which the engineers now found would be done if the original plans were carried out. The proposed alteration would involve a further absorption of the carriage-way at the spot, and a reduction in the size of the refuge in the centre of the road-way, and the Committee regarded this as highly objectionable. Modification No. 4 proposed a single staircase instead of a double one at the east side of the Mansion House, but the Committee's report insisted on the retention of the double staircase, according to the original plan. It was also recommended that before permission was given for the commencement of any of the works, the Central London Railway Company be required to satisfy the Commissioners as to their ability in all respects to complete the proposed station subways and approaches in accordance with the provisions of that company's Act of 1892.

LOCK-MAKING AND LOCK-BREAKING.—On the 16th inst., at the Goldsmiths' Institute, New Cross, Mr. H. W. Chubb delivered a lecture on "Locks." Having dealt with his subject historically, and shown designs of German and Italian workmanship, he caused to be thrown on the screen a series of views. Among the photographs shown by the lantern was one of a strong-room, 50 ft. long and weighing 40 tons, made for a Scotch bank. Its door was 4½ in. thick, and this, Mr. Chubb said, was perhaps a record for England, though in America solid steel doors of over 8 in. in thickness were known. In that country, it appears, lock-makers have even more formidable antagonists than are to be met with on this side of the Atlantic. Nitro-glycerine having been poured into keyholes, and locks thereby blasted, the expedient has been adopted of a door that has no hole or chink of any sort on its face. Then how, it would be asked, was the lock turned? As could be seen from one of Mr. Chubb's views, there is a combination of clocks and springs on the inner side of the door, which will only open at a time that was appointed when it was shut.

MAGAZINES AND REVIEWS.—We are asked to mention that the new periodical, the *Auto-Car*, referred to under the above heading as a monthly, is in fact a weekly publication; and that the *Engineering Magazine*, mentioned under the same heading as "of New York," has its London agency at the offices of the *Electrician* in Salisbury-court, Fleet-street, where it can be purchased without sending an order to New York.

LECTERN, TREVALGA CHURCH, CORNWALL.—An eagle lectern, carved in English oak, has just been placed in this church. The parish church is dedicated to St. Petrock. The new lectern has its base supported by ornamental and traceried buttresses, carved at their junction to the central stem. The amulet of the latter is also boldly carved. Messrs. Harry Hems & Sons, of Exeter, carried out the work.

THE COLSTON STATUE, BRISTOL.—The statue of Edward Colston, which has been erected in the centre of St. Augustine's open space, was unveiled by the Mayor of Bristol (Mr. W. Howell Davies) on the 13th inst. The commission for the work was placed in the hands of Mr. John Cassidy, of Manchester. The base of the statue and the pedestal rising from it are of Hoptonwood stone. The pedestal stands 10 ft. 6 in. above the pavement, and the stonework is relieved by the bronze dolphins at its corners, and by the tablets fixed to its faces. The statue is 8 ft. 8 in. in height, and Colston is represented attired in the dress of the period, with flowing wig, coat of velvet, vest of satin, and knee-breeches. The statue and the panels are in bronze, and were cast by the Coalbrookdale Company, the whole being placed in position by Messrs. W. Cowlin & Son, of Bristol.

THE REGULATION OF SHELTERS.—In a report to the Marylebone Vestry, which has been adopted by that body, Dr. Wynter Blyth, the Medical Officer of Health for the Parish of St. Marylebone, says that "the Board of Works for the Whitechapel District, the Guardians for Wandsworth and Clapham, and the Vestry of St. Margaret and St. John, Westminster, have severally passed resolutions to the effect that it is desirable that shelters should be placed under the Common Lodging-Houses Acts. These Acts lay down strict regulations as regards cubic space, closet accommodation, cleanliness, the separation of the sexes, and for the immediate notification of infectious disease. The Common Lodging Houses Acts were in London, until quite recently, carried out by the police, but now, by a Local Government Order, the provisions are carried out by the London County Council, who employ for that purpose a special staff of inspectors. I am quite of opinion that shelters should be placed under stricter regulations than it is possible to enforce at present, but I object in principle to a central authority carrying out the details of inspection, considering that the functions of such central authority should be limited to duties of general supervision, questions of main drainage, of water-supply, the direction and dimensions of new streets, the promulgation of by-laws, and so forth. To extend their powers in matters of strictly local detail will, in practice, be found to act in a wasteful and inefficient manner. I would, therefore, suggest to the Committee that it might be reported to the Vestry that it is advisable to place shelters under strict regulations, and that for this purpose a Bill giving the power to the London County Council to make by-laws for their better regulation, such by-laws to be carried into effect by the several Loca Authorities, would be desirable and should meet with the approval of the Vestry."

ALTERATIONS AT THE OPERA COMIQUE.—The Opera Comique, now under the direction of Miss Nellie Farren, has undergone some internal structural alterations which bring it more into line with modern ideas of theatre construction. The old balcony has been entirely removed and a spacious and airy pit, with well-raised floor, has been substituted, encroaching so much towards the stage, as to leave only five rows of stalls. These latter, however, have been extended laterally by the removal of two of the stage-boxes. The old pit circle on the first tier has been advanced towards the proscenium, and by the use of cantilevers of steel, supported on circular columns forms the new dress circle. The decoration does not call for special comment, being of the ordinary type. Messrs. Patman & Fotheringham have carried out the works under the superintendence of Messrs. Fowler & Hall.

AUTOMATIC FLUSH-TANKS FOR TROUGH-CLOSETS.—In dealing historically with closets in his lecture on sanitary appliances on Wednesday evening at the Carpenters' Hall, London Wall, Professor A. Wynter Blyth said that, in his opinion, the automatic flush-tank for trough-closets should not be used strictly as an automatic flush, but that it should be started by hand, otherwise there was a great waste of water with a minimum of effect. When in operation at a school, for instance, it was required only at certain times of the day, just before or just after school hours, when a large amount of excreta had to be dealt with, and when it should be started by an attendant. At night and when the closets were not in use there was no need for the tank to be in action.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The third meeting of the Session of the Discussion Section of the Architectural Association was held at 56, Great Marlborough-street, on the 20th inst., at 7 p.m. The proceedings were an entire departure from precedent, taking the form of a "Symposium of Recent Inventions." The Chairman, Mr. Herbert A. Satchell, opened the meeting in a brief introductory and explanatory speech. Short papers were then read upon the following subjects by representatives of manufacturing firms:—1. Impervious Surfaces, suitable for Exterior Work; 2. Hard Wall Facings for Interior Work, Special Plasters, &c.; 3. Fittings and Attachments for Windows; 4. The Latest in Closets. The firms personally represented were Messrs. Doulton & Co., W. B. Simpson & Sons, the Adamant Co., Jos. Robinson & Co., and Mr. Robert Adams. Illustrative samples were sent by the Fireproof Construction Co. and the N. A. P. Window Co. The members then discussed the various specialities before them, with the advantage of being able to directly question the manufacturers upon points of special interest. At the conclusion of a very useful meeting, hearty votes of thanks were passed to the firms who had contributed to the success of the evening.

MEMORIAL CHURCH, BERLIN.—Messrs. Campbell, Smith, & Co., ask us to mention that they carried out the stained glass windows in this church, having the commission for them in competition with German and French firms. We have little doubt, considering the types of stained glass generally in favour in France and Germany, that this was to the advantage of the artistic effect of the building.

RICHMOND HILL.—The Richmond Corporation and the Dysart Trustees have practically come to terms, and the public need have no further occasion to indulge in alarming prophecies with respect to the celebrated view from Richmnod Hill. Under the new arrangement between the Trustees and the Corporation, Petersham Meadows will henceforth be dedicated to the use and enjoyment of the public; and, subject to the consent of the Court of Chancery, the pretty wooded slope at the back of the "Star and Garter," will also become the property of the Corporation. These are the chief points in the

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Rebuilding Infirmary	Manchester Royal Infirmary	.....	Nov. 30
*Public Baths	Lincoln Corp.	20*l.* each	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Schools, near Derby	Brassington Sch. Bd.	G. M. Conlson	Nov. 25
*Erection of Infectious Hospital	East Grinstead U.D.C.	W. W. Gale	do.
*Roadmaking and Paving Works	Willesden D.C.	O. Claude Robson	Nov. 26
Flags, Kerbs, &c. (Haslingden Stone)	Bury (Lancs) Corp.	J. Cartwright	do.
Additions, &c to Hospital	Plymouth Union	H. J. Snell	do.
Stables, &c. Trade-street	Cardiff Corporation	W. Harpur	do.
Additions to Workhouse	Belfast Union	Young & Mackenzie	do.
Goods Shed and Offices, Darwen	Lancs. & Yorks R. Co.	*Official*	do.
Paving Upper North-street	Luton T.C.	do.	do.
Sewering River Taff	Pontypridd U.D.C.	do.	Nov. 27
Paving, &c. Works, Lannoy-road, Eltham	Lee Dist. Bd. of Wks.	do.	do.
Waterworks, Loughlinstown, Ireland	Rathdown Union	do.	do.
Sheds, &c. Paddock-grove, Boston	Boston Equit. Indus. Co-op. Soc.	do.	do.
Schools, Quay-road	Bridlington U.D.Sch.B.	J. Earnshaw	do.
Cottages and Offices, Lusk, co. Dublin	Balrothery Union	C. M. Tuite	do.
Street Works, Derwent-road	Workington U.S.A.	W. L. Eaglesfield	do.
Sewering, Mills Hill-road	Middleton (Lancs) Corp.	W. Wellburn	do.
Pipe Sewer, &c.	Witham (Essex) U.D.C.	A. M. Clarke	do.
Road Works, Pine street	Jarrow Impt Com.	J. Petree	Nov. 28
Two Semi-detached Villas, Donaghadee, Ireland	J. Mulholland	T. Pentland	do.
Seven Houses, Hamer-street, Radcliffe, Lancs	Radcliffe & Pilkington Co-op. Soc Lim.	.....	do.
Sorting Office	Carlisle Citadel Station Committee	.....	Nov. 29
Additions to School, Dudley-road	Wolverhampton S. B.	T. H. Fleeming	do.
House at Pumping Station, High-street	Glasgow Corp	J. M. Gale	Nov. 30
*Erecting Purifying House	Sheffield Gas Co.	F. W. Stevenson	do.
Footbridge, Ford, near Brook Farm, Timsbury	Romsey R.D C.	J. Jenvey	do.
Paving and Kerbing Works	New Malden U.D.C.	T. V. H. Davison	do.
Four Houses, Allerton, Yorks	.....	Rycroft & Firth	do.
Additions, &c. to Mar Castle, Braemar, N.B.	.....	A. M. Mackenzie	do.
Iron Footbridge over River Browney, Durham	Brandon & Byshottles U.D.C.	*Official*	do.
School, Bow Brickhill	Fenny Stratford Sch. Board	do.	Dec. 2
*Laying Sewer in Leigh-road	Borough of Southend	Harold Harlock	do.
*Wood Paving	Holborn Bd. of Works	L. H. Isaacs	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Water Tower, Bartley Green, near Birmingham	King's Norton R.D.C.	R. Godfrey	Dec. 2
*Repairs and Materials, Guildford	War Department	*Official*	do.
*Construction of River Walls	Vestry of Rotherhithe	Norman Scorgie	do.
Additions, &c. to Schools, Tredegar	Bedwelly School Bd.	James & Morgan	do.
*Erection of Bankruptcy Offices, Manchester	Com. of H.M. Works	Mr. Flen	Dec. 3
*Construction of Settling Tanks, &c.	Sutton-in-Ashfield, U.D.C.	.....	do.
*Kerbing, Tar Paving, &c.	Lewisham Bd. of Wks.	*Official*	do.
School and House	Corwen (Wales) School Board	J. D. Denny	do.
School, &c. Dinas, Glam.	Ystradyfodwg Sch. Bd.	J. Rees	do.
Schools, Ampfield, near Romsey	.....	Colson & Son	Dec. 4
Church, Aughebrack, Derry, Ireland	Rev. J. McGlinchy	E. J. Toye	Dec. 5
*Making Patent Tiles for Fireproof Floors	A. D. Dawnay, Esq.	.....	do.
*Supply of New and Purchase of Old Stores	G.N. Railway Co.	.....	Dec. 7
*Erection of Boiler House, &c.	Burton-on-Trent Union	R. Stevenson	Dec.
*Repairs to Workhouse	Paddington Guardians	E. H. Sim	Dec. 10
*Wood Pavements	Streets Committee (Comrs. of Sewers)	*Official*	do.
Sewer and Outfall, Aberdovey, Wales	Towyn U.D.C.	M. W. Davies	Dec. 11
*Erection of Pumping Station	Mansfield Corporation Water Works	G. & F. Hodson	Dec. 13
Stabling, &c. Patricroft	Eccles Corporation	A. C. Turley	do.
*Construction of Railway	L. B. & S. C. Ry. Co.	*Official*	Dec. 14
Lodging House, Darwen, Lancs.	.....	Woods & Thackeray	Dec. 16
Waterworks, Hazon and Morwick	Amble U.D.C.	*Official*	do.
Alterations to Business Premises, Windermere	H. B. Dawes	R. Walker	No date
Fifteen Cottages, Morriss-street, Peterborough	F. Smith	J. G. Stallebrass	do.
Four Houses, Apple Tree Carr, Burnley	O. Emmett	.....	do.
Two Pairs Semi-detached Villas, Beeston, Notts	.....	C. N. Holloway	do.
Rebuilding Red Lion Inn, Stamford-street, Ashton-under-Lyne	.....	J. H. Burton	do.
Road Works, Cranbourne-road, Allerton, Yorks	.....	Fairbank & Wall	do.
Two Pairs Semi-detached Villas, West Bridgford, Notts	.....	E. H. Child	do.
Villa, Hall-road, Eccleshill, Yorks	.....	Kendall & Bakes	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Poplar Board of Works	2*l.* 10*s.* per week	Nov. 26
*Engineer	Garstang R.D.C.	.....	Nov. 27
*Resident Engineer and Clerk of Works	Portishead U.D.C.	3*l.* 10*s.* weekly	Nov. 30

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., viii., & xviii. *Public Appointments, p.* xvi.

settlement of a dispute which at one time threatened to assume a very angry complexion, and which might have terminated in a manner disappointing to all admirers of one of the finest landscape views in the world.

LEGAL.

A QUESTION OF LIGHT AND AIR AT PLYMOUTH,

BEFORE his Honour Judge Edge at Stonehouse, on the 11th inst., Richard Pearse, owner of a house at 11, Prospect-place, Plymouth, claimed 50*l.* damages from William Lapthorn, contractor, Plymouth, for erecting a workshop upon a wall alleged to belong solely to plaintiff, and thus causing an obstruction to light and air. Plaintiff also asked for an injunction to restrain defendant from continuing the trespass and obstruction.

Mr. R. R. Rodd, jun., for plaintiff; Mr. P. T. Pearce (instructed by Wilson & Love) for defendant.

Mr. Rodd said plaintiff was the executor of his father, who was possessed of 11, Prospect-place by deeds dated 1826. The wall was plaintiff's. Defendant had erected a workshop on the wall, with the result that necessary air and light to plaintiff's premises were seriously interfered with. Although notice was given defendant not to continue to build on the wall he had done so. Plantiff's tenants had been many of them in the house for nearly twenty years, and all objected to the obstruction. The building was of corrugated iron and wood, and doubtless could be removed at no great expense.

Messrs. A. W. Debnam, E. M. Leest, & H. G. Luff (architects and surveyors), and plaintiff bore out counsel's statement, and Messrs. Austin, Burleigh, John Gill, and Mrs. Sowden spoke of the baneful effect upon the light and air in the rooms and courtyard.

Mr. J. Teague gave similar evidence. A wall at right-angles to the one in dispute belonged to him, and he had forced defendant to take down part of his building. He had called upon Mr. Pearse more than once to repair the wall, and Mr. Pearse had done so.

For the defence Mr. Pearce called Mr. A. Corderoy, who gave his reasons for considering the wall a party-wall. With regard to air, there were 248 superficial feet of air in the courtyard, which was 240 superficial feet in area, before defendant put up his building. There were now 172 superficial feet of air; amply sufficient, the usual expert allowance being 6 in. for every superficial foot of courtage. The erection had rather increased than decreased the current of air, on the mine principle that a higher funnel increased draught. With regard to the light, he failed to see how the erection could make any appreciable difference. The sun would have to shine due north to cast a shadow on Mr. Pearce's property, and even if it did, the effect would be very small.

Cross-examined, witness asserted that the evidence of the tenants was largely nonsense, and added that he had proved that scientifically. His honour deferred judgment.—*Western Morning News.*

MEETINGS.

FRIDAY, NOVEMBER 22.

Architectural Association.—Dr. G. B. Longstaff, L.C.C., on "The Municipal Control of Buildings." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. Charles Mason on "Scavenging, Disposal of House Refuse." 8 p.m.

SATURDAY, NOVEMBER 23.

Builders' Clerks' Institution of Great Britain.—Meeting in Room 13 of the Westminster Town Hall, Caxton-street. 6 p.m.

SUNDAY, NOVEMBER 24.

Sunday Lecture Society (St. George's Hall, Langham-place).—Mr. Wyke Bayliss on "The Use of the Supernatural in Art." 4 p.m.

MONDAY, NOVEMBER 25.

Surveyors' Institution.—Mr. R. M. D. Saunders on "Landlords and Tenants in Ireland." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. P. Fitzgerald, M.A., on "Robert Adam and his Style." 7.30 p.m.

TUESDAY, NOVEMBER 26.

Institution of Civil Engineers.—Paper to be further discussed:—"The City and South London Railway: Subaqueous Tunnelling by Shield and Compressed Air;" by Mr. J. H. Greathead. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Sewerage and Sewage Disposal." 8 p.m. Postponed from Tuesday, November 19.

WEDNESDAY, NOVEMBER 27.

Carpenters' Hall, London Wall (Lectures on Building and Sanitary Construction).—Mr. James Bartlett on "Setting Out Work and By-laws." 8 p.m.

Society of Arts.—Mr. H. H. Cunynghame on "Locomotive Carriages for Common Roads." 8 p.m.

Liverpool Engineering Society.—Mr. Arthur Musker on "Artificial Paving Slabs." 8 p.m.

THURSDAY, NOVEMBER 28.

Society of Antiquaries.—8.30 p.m.

Institution of Electrical Engineers.—(1) Mr. F. Bathurst on "The Electric Wiring Question"; (2) Mr. S. Mavor on "Concentric Wiring." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

19,574.—WINDOWS: *W. Youlten.*—Apertures are made in the boxed frame of sliding sash windows, which admit air when the window is closed, the current being regulated by a hit-and-miss ventilator, opened and closed by a handle and rod.

20,695.—WATER-CLOSETS: *F. Wells.*—For providing a well-ventilated closet, a box is moulded on the outside of the earthenware bowl of the closet, and divided into two chambers, the upper one of which receives the water-supply and delivers it into the flushing rim; the other is connected with a ventilator and the interior of the closet-bowl, by this means leading away any objectionable smell.

22,297.—WINDOWS: *A. Barr.*—For swivelling window-sashes into apartments a rod is passed through a number of eyes fixed in alignment to the frame and sash. The window may then be turned as on a pivot. Catches are used for locking the upper and lower sashes together so that both may turn on the same hinge.

23,469.—WATER-CLOSETS: *J. Tennant.*—Flushing apparatus for water-closets and the like, comprising a cistern provided with a vertical flushing-pipe open at the top and fitted with an external flange, and a hood furnished with a float and arranged to surround the open end of the flushing-pipe. Space is left between the pipe and floating hood for the passage of water between the two, the arrangement being such that upon the latter being caused to quickly move downwards by means of a lever, water within it and above the flange will be forced into the flushing-pipe and the flush started.

23,723.—CASEMENTS: *W. Youlten.*—A casement is hinged upon centres or pivots to the frame in such a manner that it may either swing inwards or outwards. Between the abutting surfaces of all the sides of the casement frame, suitable weather check devices are provided.

24,946.—KILNS: *G. Warren.*—Relates to a kiln provided with three central flues at different heights, and connected to the different chambers by short flues. The object is to promote combustion, and to utilise the waste heat from chambers which are cooling, for drying unburnt bricks or other articles in other chambers.

4,184.—VENTILATOR: *F. Barker.*—Ventilator for causing an up-draught, consists of a vertical foul-air shaft or chamber, with or without internal divisions, and having one or more air provisions near the upper end, communicating with the adjacent outer chamber. One or more outer chambers are formed by enclosing the shaft with casings at a suitable radial distance, such chambers being provided with internal divisions, and having outlet openings, each outlet being protected by a baffle-plate. The whole is surmounted by a suitable cap.

NEW APPLICATIONS FOR LETTERS PATENT.

NOVEMBER 4.—20,774, W. Bryan, Preventing Waste of Water and Pipes Freezing and Bursting.—20,781, M. Adam and G. Gerrey, Fittings for Sash-windows.

NOVEMBER 5.—20,840, O. Steed, junior, Water-taps and Valves.—20,852, A. Brown and H. Price, Ventilators.—20,863, J. Shanks, junior, Ships' Water-closets.—20,880, J. de Lara Cohen and A. Dell, Excluding Draught and Rain.—20,892, J. Thomlinson, Fireproof Walls or Partitions.—20,900, W. Turton, Fire and other Bricks.

NOVEMBER 6. — 20,995, W. Tickle, Woodworking Machinery.—20,999, H. Hunt, Wood Screws.—21,006, A. Boult, Flushing Apparatus.

NOVEMBER 7.—21,035, C. Hocking, Ventilator.—21,070, A. Stokehill, Sash-fastener.

NOVEMBER 8.—21,179, J. Bowley, Bolts or Fastenings for Doors, &c.—21,187. J. Long, Adjustable Seats for Water-closets.—21,197, J. Edwards, Locking or Fastening Doors, &c.

NOVEMBER 9.—21,233, R. Wandsworth, Tip-Waggons, Vans, and Carts.—21,251, E. Ives, Sewage Disposal Works for Towns, &c.—21,281, R. Smith, Upholstered Furniture.—21,293, F. Golby, Cement or Plaster Compound.—21,208, P. Waldram, Forming Joints between Lead or similar Material, and Earthenware or similar Material.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,406, R. Markham, Saw Set for Mill-saws.—17,455, H. Evans, Hygienic Cistern.—19,172, P. Willis, Fire-grates.—19,174, A. Cleaves and A. Warren, Regulating the Angle of Looking-glasses and Windows.—19,868, D. Holland, Gully-traps and other Trapping Devices for Sanitary purposes.—19,902, G. Nightingale, Machine for Cleaving and Dividing Rock, Stone, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

21,745, D. Arámburu. Surveying Instruments.—474, G. Parkinson, Guarding Circular or other Saws.—13,442, E. von Leistner and H. Goetler, Building setts.—17,340, A. Boult, Floor and Ceiling Plates.—18,842, F. Golby, Fireproof Rafters and Lathing for Buildings.—18,893, A. Mountain. Joints for Socketed Earthenware and other Sanitary Pipes, &c.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

NOVEMBER 1.—By *Moedy & Son* (at Shepton Mallet): F. farmhouse and enclosure, West Compton, Somerset, 25 a. 1 r. 15 p., 1,047*l.*

NOVEMBER 4.—By *C. Clarke & Co.* (at Cardiff): 134, Severn-rd., Cardiff, and land adjoining, f., 4,000*l.*; 1, 3, 5, and 7, Severn-rd, f., 1,000*l.*; two plots of bldg. land, King's-rd., f., 535*l.*; moiety of 10, Queen-st., f., r. 250*l.*, 2,860*l.*; g.r. 81. 10s., Bute-st., 530*l.*

NOVEMBER 6.—By *T. Edwards & Sons* (at Stoke): Homestead, 6 cottages and 17 a. 2r. 14 p., f., Acton, Staffs., 1,721*l.*; "The Swinnerton Arms" public-house, Stone, &c., Staffs., and 1 a. 0r. 31 p., f., 1,060*l.*; houses, cottages and enclosures, 43 a. 3 r. 20 pt. f., 2,965*l.*; "Berryhill Farm," 158 a. 3 r. 36 p., f., 4,715*l.*; a f. cottage, enclosures, &c., 14 a. 0 r. 9 p., 865*l.*—By *F. Miller* (on the Premises): "Grange Mount," Norwood, and ¾ acre, u.t. 67 yrs., g.r. 30*l.*, 3,000*l.*

NOVEMBER 11.—By *J. H. Bethell:* 66 and 68, St. Stephen's-rd., Upton-pk., f., r. 50*l.* 14s., 520*l.*; 29, Plashet Grove, f., r. 27*l.* 6s., 280*l.*—By *L. Farmer:* 7 and 8, Springfield Villas, Kilburn, u.t. 49 yrs., g.r. 16*l.*, e.r. 100*l.*, 600*l.*—By *Sales & Wiltshire* (at Lee): 75, 77, and 79, Brightfield-rd., Lee, Kent, u.t. 89¼ yrs., g.r. 15*l.* 6s., 600*l.*

NOVEMBER 12.—By *F. J. Bisley & Sons:* 423 to 433 (odd), Southwark-pk.-rd., Bermondsey, u.t. 57 yrs., g.r. 30*l.*, 1,820*l.*; 144, Lynton-rd., u.t. 46½ yrs., g.r. 6*l.* 10s., r. 42*l.*, 395*l.*; f.g.r. 33*l.*, Fawe-pk.-rd., Putney, reversion in 97½ yrs., 900*l.*—By *Rogers, Chapman, & Thomas:* 76, Redcliffe Gardens, Kensington, u.t. 56¾ yrs., g.r. 25*l.*, 1,090*l.*—By *H. J. Bromley:* 39, Kirkdale, Sydenham, u.t. 52 yrs., g.r. 11*l.* 2s. 6d., r. 50*l.*, 460*l.*—By *Thurgood & Martin:* 61, 65, and 67, Gower-st., Bloomsbury, u.t 28 yrs., g.r. 96*l.*, r. 405*l.*, 2,310*l.*; "Woodland Cottage," Mildmay-av., Stoke Newington, and wheelwright's premises adjoining, u.t. 65 yrs., g.r. 7*l.*, r. 56*l.* 4s., 380*l.*; 61, South Molton-st., Oxford-st., u.t. 8¼ yrs., g.r. 85*l.*, r. 195*l.*, 50*l.*; 205, Westbourne-gr., Bayswater, u.t. 54 yrs., g.r. 6*l.* 10s., r. 80*l.*, 800*l.*

NOVEMBER 13.—By *Martin, Clarke, & Co.:* 86, Ferrier-st., Wandsworth, u.t. 81 yrs., g.r. nil, e.r. 32*l.* 10s., 245*l.*; 51, Sidney-rd.. Stockwell, u.t. 44 yrs., g.r. 4*l.* 10s., r. 32*l.*, 220*l.*

NOVEMBER 14.—By *C. Saunders & Son:* 7, Ryde Vale-rd., Balham, u.t. 79 yrs., g.r. 10*l.*, r. 45*l.*, 350*l.*; 1, Dornton-rd., u.t. 78 yrs., g.r. 7*l.* 10s., r. 35*l.*, 250*l.*; 33, 32, 34 and 36, Sheen-pk., Richmond, u.t. 82 yrs., g.r. 31*l.* 4s., r. 124*l.*, 1,120*l.*; 76, Townshend-ter., u.t. 63 yrs., g.r. 5*l.*, r. 22*l.*, 200*l.*—By *Stimson & Sons:* 44 and 46, Russell-rd., Holloway, f., r. 87*l.*, 1,080*l.*; 10 and 12, Wenlock-st., Hoxton, u.t. 46¾ yrs., g.r. 10*l.* 14s. 8d., r. 80*l.*, 690*l.*; 15, Alma-st., u.t. 39½ yrs., g.r. 5*l.*, r. 38*l.*, 350*l.*; 40, Newington Butts, Newington, u.t. 57 yrs., g.r. 20*l.*, r. 65*l.*, 410*l.*; No. 881, Old Kent-rd., u.t. 76 yrs., g.r. 11*l.* 13s. 4d., r. 60*l.*, 400*l.*; 40, Queen's-rd., Peckham, f., e.r. 60*l.*, 600*l.*; 24 to 34 (even), Townley-st., Walworth, u.t. 69 yrs., g.r. 20*l.*, r. 117*l.*, 360*l.*—By *Newbon & Co.:* 17, Queen's-rd, Finsbury-pk., u.t. 64 yrs., g.r. 8*l.*, e.r. 45*l.*, 375*l.*; 35, Rushton-st., Hoxton, u.t. 39½ yrs., g.r. 5*l.*, r. 32*l.*, 295*l.*; 43, Gopsall-st., u.t. 41 yrs., g.r. 5*l.* 10s., r. 34*l.*, 275*l.*; 69, Ifield-rd., Kensington, u.t. 53 yrs., g.r. 8*l.*, r. 40*l.*, 350*l.*; 90 and 160, Ifield-rd., u.t. 71 yrs., g.r. 15*l.*, r. 105*l.*, 990*l.*; 50, 52, 54, and 58, Hyde-rd., Hoxton, u.t. 41 yrs., g.r. 24*l.* 4s., r. 148*l.*, 1,340*l.*; 42 and 44, Salisbury-rd., Holloway, u.t. 74½ yrs., g.r. 16*l.*, r. 63*l.* 14s., 265*l.*; two plots of land, Macdonald-rd., New Southgate, f., 415*l.*; a plot of land, Alexandra-pk.-rd., Wood Green, f., 85*l.*—By *C. C. & T. Moore:* 28, 31, 33, 35, 37, and 39, Ireton-st., Bow, u.t. 78 yrs, g.r. 18*l.*, 530*l.*; two plots of freehold land, Woolmer-rd., Edmonton, 50*l.*; f.g.r. 18*l.*, Church-rd., Tottenham, reversion in 75 yrs., 400*l.*—By *Tuckett & Son* (at Forest Gate): 61 plots of bldg. land, South Esk-rd., East Ham, 3,451*l.*; 15 plots of bldg. land, Red Post-lane, 1,410*l.*

NOVEMBER 15.—By *G. A. Wilkinson & Son:* F.g.r. 300*l.*, Milk-st., City of London, reversion in 38½ yrs., 10,000*l.*; f.g.r. 70*l.*, Clement's-crt., reversion in 38½ yrs., 2,400*l.*; f.g.r. 25*l.*, Clement's-crt., reversion in 6 yrs., 1,240*l.*; a fee farm rent of 10*l.*, Cripplegate-bldgs., 325*l.*; 82, Sclater-st., Bethnal Green, f., e.r. 50*l.*; 84, Sclater-st., u.t. 26 yrs., g.r. 35*l.*; e.r. 52*l.*, together with goodwill, 1,000*l.*: 90 and 91, Sclater-st., f., r. 110*l.*, 1,305*l.*; 27, Gunst., Spitalfields, f., r. 40*l.*, 540*l.*; 77, Wellesley-rd, Croydon, f., r. 70*l.*, 850*l.*—By *Beard & Son:* 74, Talbot-rd., Bayswater, u.t. 63¾ yrs., g.r. 11*l.* 11s., e.r. 75*l.*, 490*l.*—By *E. H. Henry:* 7, Goda-st., Kennington, c., r. 20*l.*, 300*l.*; 49, Barrington-rd., Brixton, u.t. 27 yrs., g.r. 1s., 330*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent, r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 — 9/0/0
Teak, E.I.	load	10/0/0 — 16/0/0
Sequoia, U.S. ft. cu		1/8 — 1/10
Ash, Canada	load	3/0/0 — 4/5/0
Birch, do.		2/0/0 — 3/5/0
Elm, do.		3/15/0 — 5/0/0
Fir, Dantsic, &c.		2/0/0 — 3/10/0
Oak, do.		2/15/0 — 4/15/0
Canada		6/5/0 — 7/15/0
Pine, Canada red		0/0/0 — 0/0/0
Do. Yellow		2/10/0 — 4/15/0
Lath, Dantsic, fath		4/10/0 — 5/10/0
St. Petersburg		5/0/0 — 6/10/0
Wainscot, Riga, &c., log		2/15/0 — 5/0/0
Odessa, crown		2/15/0 — 5/0/0
Deals, Finland 2nd & 1st std	100	7/0/0 — 8/10/0
Do. 4th & 3rd		7/0/0 — 8/0/0
Do. Riga		7/0/0 — 8/0/0
St. Petersburg, 1st yellow		9/10/0 — 12/0/0
Do. 2nd yellow		7/10/0 — 9/0/0
Do. white		8/0/0 — 9/10/0
Swedish		7/0/0 — 15/10/0
White Sea		7/5/0 — 14/0/0
Canada, Pine 1st		21/0/0 — 24/0/0
Do. do. 2nd		16/0/0 — 17/0/0
Do. do. 3rd, &c.		8/0/0 — 10/0/0
Do. Spruce, 1st		9/0/0 — 10/10/0
Do. do. 3rd and 2nd		6/10/0 — 7/10/0
New Brunswick		6/0/0 — 7/0/0
Battens, all kinds		5/0/0 — 20/0/0
Flooring boards, sq., 1 in. prep. 1st		0/9/6 — 0/14/6
Do. 2nd		0/6/6 — 0/11/6
Other qualities—		0/4/6 — 0/7/6
Cedar, Cuba ..ft.		/4 — /4½
Honduras, &c.		/3½ — /4½
Mahogany, Cuba		/2½ — /6
St. Domingo, cargo av.		/2½ — 1/0
Mexican do. do.		/5½ — /4½
Tobasco do. do.		/4 — /6
Honduras do.		/4 — /6
Box, Turkey	ton	4/0/0 — 15/0/0
Rose, Rio		7/0/0 — 16/0/0
Bahia		6/0/0 — 15/0/0
Satin, St. Domingo		0/0/5 — 0/1/0

TIMBER (*continued*).		
Satin, Porto Rico		0/0/6 — 0/1/6
Walnut, Italian		0/0/3 — 0/0/7

METALS.		
Iron—Pig, in Scotland	ton	2/6/3½ — 0/0/0
Bar, Welsh, in London		5/12/6 — 5/15/0
Do. do. at works in Wales		5/2/6 — 5/5/0
Do. Staffordshire, in London		6/0/0 — 6/10/0
COPPER—British cake and ingot		47/0/0 — 47/5/0
Best selected		47/10/0 — 48/0/0
Sheets, strong		54/0/0 — 0/0/0
Chili bars		43/0/0 — 43/5/0
YELLOW METAL		0/0/4 9-16 — 0/0/4⅝
LEAD—Pig Spanish	ton	11.8 9 — 11/10/0
English com. brands		11/12/6 — 11/15/0
Sheet, English, 6 lbs. per sq. ft. and upwards		12/10/0 — 12 12 6
Pipe		12/10/0 — 0/0/0
ZINC—English sheet	ton	18/5 0 — 18/10/0
Vieille Montagne		18/15/0 — 0/0/0
TIN—Straits		64/17/6 — 65/7/6
Australian		65/15/0 — 66/5/0
English Ingots		68/15/0 — 69/0/0
Banca		67/0/0 — 67/5/0
Billiton		66/10/0 — 66/15/0

OILS.		
Linseed	ton	19/10/0 — 20/5 0
Cocoanut, Cochin		25/0/0 — 25/5/0
Do. Ceylon		22/15/0 — 0/0/0
Palm, Lagos		22/10/0 — 0/0/0
Rapeseed, English pale		24/0/0 — 24/5/0
Do. brown		22/10/0 — 22/15/0
Cottonseed ref.		17/0/0 — 17/10/0
Oleine		19/10/0 — 20/10/0
Lubricating, U.S.		5/6/0 — 8/6/0
Do. black		4/9/0 — 6,6/0
TAR—Stockholm	barrel	0/19/6 — 0/0/0
Archangel		0/15 0 — 0 0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender.]

ALDEBURGH (Suffolk).—Accepted for additions to house, for Miss Dunn. Mr. T. E. Key, architect, 5, Blooms bury-square, W.C.:—
G. O. Knowles, Aldeburgh £115

AYLESBURY.—For new farm buildings, Dunsham Farm. Mr. W. F. Taylor, architect, Aylesbury:—

Grist	£692 18	Webster & Cannon, Aylesbury *	£638 0
Heley	656 11		
Wm. Cannon	644 6		

* Accepted subject to modification.

BELPER (Derbyshire).—For sinking a well near Chevin Mill, Ashbourne-road, Belper, for the Urban District Council. Messrs. George & Frederic W. Hodson, Engineers, Loughborough:—

T. Tilley & Sons	£5,926 10 9	Wm. Hickman & Bros.	£4,072 19 0
E. Timmins & Sons	5,745 4 0	Robt. Hallam	3,666 7 0
J. Tomlinson	4,370 0 0	J. F. Price, Nottingham (accepted)	3,054 15 0
E. Tempest	4,312 5 6		

BROMLEY.—For building a house at Sundridge Park Avenue, Bromley, Kent, for Mr. Alfred Barrow. Mr. L. V. Hunt, architect, 35, Queen Victoria-street, E.C. Quantities by Mr. F. G. W. Buss, 44, Theobald's-road:—
L. Whitehead & Co. £2,850
[No competition.]

CARDIFF.—For additions, &c., to Workhouse, for the Union Guardians. Mr. Edwin Seward, architect, Queen's Chambers, Cardiff:—

Frank Ashley	£789 13 9	Geo. Griffiths	£725 0 0
W. Symonds & Co.	764 0 0	David Davis	704 0 0
Charles C. Dunn	738 0 0	James Allan	696 0 0
S. Shepton & Son.	733 0 10	J. F. Beer & Sons, Angus-street *	679 0 0
W. Thomas & Co.	730 0 0		

* Accepted.

DRIGHLINGTON (Yorks.).—For alterations, &c., to Primitive Methodist Chapel. Mr. T. A. Buttery, architect, Queen-street, Morley:—

Masonry.—Barraclough & Grayshon, Adwalton	£185 0
Joinery.—J. Hook, Armley	170 0
Plumbing.—J. Booth & Son, Drighlington	52 18
Plastering.—E. Wilson, Morley	54 0
Slating.—Sharp & Harper, Leeds	49 10

GATESHEAD-ON-TYNE.—For the erection of bakery at Low Fell, for the Gateshead Industrial Co-operative Society, Limited. Mr. E. Bowman, architect, 62, Grainger-street, Newcastle-on-Tyne. Quantities by the architect:—

Jas. Lunn	£1,757	E. & T. George	£1,627
T. & R. Lamb	1,709	Draper & Sons	1,618
W. C. Tyire	1,693	Wakefield & Henderson, Low Fell *	1,573
Hunter & Co.	1,688		
Raven & Hitcham	1,658		

* Accepted.

GOFF'S OAK (Herts.).—For the erection of two cottages at Goff's Oak, for the Receiver for the Metropolitan Police District. Mr. John Butler, Architect. Quantities by Mr. W. H. Thurgood:—

Higgs & Hill	£1,784	Waterman	£1,620
Lawrence & Sons	1,745	Willmott	1,595
Gardener	1,650	Bunce	1,590
Richardson	1,625	Almond & Son	1,488

GREAT KIMBLE (Tring).—For building new infants' room. Mr. W. F. Taylor, architect, Aylesbury:—

J. S. Holland	£335 0	Grist	£268 18
Simon & Clarke	294 8	Webster & Cannon, Aylesbury (accepted)	258 0
Crook	290 0		

GUILDFORD.—For the supply of 600 tons blue Guernsey granite, for the Corporation. Mr. F. T. Maltby, C.E., Borough Surveyor, Guildford:—

	Per ton. s. d.
S. Trickett & Sons	16 5
L. Sommerfield	15 0
W. Griffiths	15 0
G. Le Maitre	15 0
A. & F. Manuelle	14 11
R. L. & J. Fennings, 12, Wellington Chambers, S.E. *	14 6

* Accepted.

HEXHAM.—For the erection of a Branch Bank for Messrs. Lambton & Co., bankers, Newcastle-on-Tyne. Mr. John W. Dyson, architect, Grey-street. Quantities by Mr. J. P. Allen, Granger-street, West Newcastle:—

T. Weatheritt	£5,267 10 3	W. & J. Darlington Hexham *	£5,016 13 4
Middlemiss Bros.	5,243 13 0		
W. C. Tyrie	5,180 0 0		

* Accepted.

KIDDERMINSTER.—For the execution of road-works, Sutton-road, for the Rural District Council. Mr. G. J. Shepherd, surveyor, 69, Chester-road, Kidderminster:—

T. Vale	£265	G. Law, Kidderminster *	£232

[Surveyor's estimate, £245.]
* Accepted conditionally.

KINGSTHORPE (Northants.).—Accepted at a schedule of prices for paving, &c., Lincoln and two other streets, for the Urban District Council. Mr. John Ingman (Ingman & Shaw), surveyor, 7, George-row, Northampton:—
R. Finnegan, Northampton.

KINGSTHORPE (Northants.).—Accepted at a schedule of prices for paving, kerbing, &c., Currie-road, and four others, for the Urban District Council. Mr. John Ingman (Ingman & Shaw), surveyor, 7, George-row, Northampton:—
R. Cosford, Northampton.

LEICESTER.—For the erection of a new factory, South Bond-street, Leicester, for Mr. H. J. Creese. Mr. J. Smith, architect, Briton-street, Leicester:—

Gretton & Woolley	£449 0	J. Mason & Sons	£413 0
J. R. Cooke	442 7	U. Gurney	401 0
J. H. Clayton	440 0	F. Elliott *	396 0
J. N. Hill	426 0		

* Accepted.
[All of Leicester.]

LONDON.—For electric light wiring and fittings at the London Cancer Hospital, Brompton, for the Committee of the Cancer Hospital, Brompton, S.W. Mr. Morgan Williams, Assoc.M.Inst.C.E., Consulting Engineer:—

	Wiring. £ s.	Cutting away and making good. £ s.	Fittings exclusive of lamps. £ s. d.	Total. £ s. d.
Crompton & Co.	668 0	45 0	107 8 0	820 8 0
Rashleigh, Phipps, & Co.	523 0	20 0	115 5 6	658 5 6
H. M. Leaf	332 0	25 0	99 11 6	454 11 6
Drake & Gorham *	3 9 0	25 0	86 19 0	420 19 0
Sotheby & Co.	293 10	26 10	77 14 0	397 14 0

* Accepted.

LONDON.—For the erection of new premises at 13 and 14, Broadway, Deptford, for Messrs. Platau. Mr. L. Solomon, architect, 55, New Broad-street, City, E.C.:—

Hanley	£3,268	Holloway	£3,030
Patman	3,120	Cousell	2,923
Downs	3 078	Roberts	2,879
Scott	3,033	Reason (accepted)	2,869

LONDON.—For office fittings, &c., at 10, Bury-court, St. Mary-Axe, for Messrs. Lazarus. Mr. L. Solomon, architect, 55, New Broad-street, City, E.C.:—

Reason	£202	Roberts *	£184

* Accepted.

LONDON.—For rebuilding Nos. 65 and 67, St. John-street, Smithfield. Messrs. Saunders & Son, architects, 6, Bishopsgate-street-without:—

Lawrence	£1,712	Battley, Son, & Holness	£1,643
Broome	1,680	Garratt	1,599
Woodward	1,680	Jerrard	1,580
Reason	1,660	Richardson	1,539

LONDON.—Accepted for new shop front for Messrs. Huntley & Co., No. 1, Conduit-street, W.:—
Allard & Co. £340

LONDON.—For the erection of twelve houses, Munster-road, Fulham, S.W., for Mr. Edwin Saunders. Mr. Joseph G. Denton, architect, 51, Bowerdean-street, Fulham, S.W.:—

Cory	£4,600	Saywell, Fulham *	£4,320
Groom	4,410		

* Accepted.

LONDON.—For alterations to Nos. 18 and 22, Warwick-street, Pimlico, for Mr. Howels. Mr. W. A. Large, architect, 83, Chester-street, S.W. No quantities:—

King	£939	L. Whitehead & Co.	£8 0
Roffey	912		

LONDON.—For building a new factory at Rufus-street, Old-street, E.C., for Mr. Souhami. Mr. L. V. Hunt, architect, 35, Queen Victoria-street, E.C. Quantities by Mr. F. G. W. Buss, 44, Theobald's-road:—

Wilson	£1,474 9 6	Gould & Brand	£1,173 0 0
Stewart	1,393 0 0	L. Whitehead & Co.	1,120 0 0
McCormick	1,356 0 0		

LONDON.—For the supply of 500 tons broken blue Guernsey granite, for the Vestry of St. Matthew, Bethnal Green. Mr. F. W. Barratt, Surveyor, Vestry Hall, Church-row, Bethnal Green, E.:—

	s. d.		s. d.
Muir & Co.	13 6	Gibbs	13 6
Mowlem & Co.	12 11	Manuelle	12 11
Fennings	13 0	W. Griffiths, Kingsland *	12 5
Sommerfield	13 10		

* Accepted.

LONDON.—For extending the system of low-pressure hot-water apparatus in the present building to the new portion of the Church-street School, Stoke Newington, for the School Board for London:—

Geo. Davies	£186 0	Duffield & Co.	£84 0
W. G. Cannon & Sons	108 15	J. F. Clarke & Sons, Moorgate-street *	79 0
J. C. & J. S. Ellis, Ltd.	97 10		
T. Green & Son, Ltd.	96 0		

* Recommended for acceptance by the Works Committee.

LONDON.—For providing relief mains and additional heating surface at the Duncombe-road School, Upper Holloway, for the School Board for London:—

Geo. Davis	£322 0	J. Wontner-Smith, Gray & Co. *	£108 10
J. & F. May	177 0		
Vaughan & Brown, Ltd.	120 0		

* Recommended for acceptance by the Works Committee.

LONDON.—For carrying out works at the Edward-street Transferred School, Deptford, with a view to adapting the building for the purposes of a special school, and also for the accommodation of girls and infants, for the School Board for London. Mr. T. J. Bailey, Architect:—

A. Black & Son	£426	E. Proctor	£300
Mid-Kent Building and Contracting Works, Ltd.	420	S. Frampton	298
J. & C. Bowyer	364	J. Kiddle & Son, Norton Folgate*	247
W. Akers & Co.	339		

* Recommended for acceptance by the Works Committee.

LONDON.—For erecting a school for special instruction in connexion with the Bath-street School, City-road, to accommodate 90 children, and for erecting a new cookery centre and for other work, for the School Board for London. Mr. T. J. Bailey, Architect:—

N. Lidstone	£3,343	0	0	W. M. Dabbs	£2,812	0	0
McCormick & Sons.	3,051	0	0	E. Lawrance & Sons	2,750	0	0
Killby & Gayford	3,025	0	0	George Munday & Sons	2,742	6	3
J. Grover & Son	2,947	0	0	W. King & Son	2,729	0	0
W. Shurmur	2,898	0	0	Treasure & Son	2,720	0	0
Dove Bros.	2,897	0	0	Johnson & Co.	2,707	0	0
G. S. S. Williams & Son	2,854	0	0	Charles Cox, Hackney*	2,642	0	0
Staines & Son	2,837	0	0				

* Recommended for acceptance by the Works Committee.

LONDON.—For the construction of a brick-sewer, &c., Cornwall-road, for the Vestry of St. Mary Abbots, Kensington:—

Wimpey & Co.	£2,300	Rowell & Robson	£1,345
G. Bell	1,959	C. W. Killingback	1,341
A. Kellett	1,769	R. Ballard	1,329
T. Adams	1,610	E. Rogers & Co., St. Lawrence-road, North Kensington*	1,293
J. Mears	1,548		
Wm. Neave	1,420		

* Accepted.

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus for warming the first portion of a school on the site in Bailey's-lane, South Tottenham, to provide accommodation for 393 children, for the School Board for London. Mr. T. J. Bailey, Architect:—

J. Gibbs & Son	£483	16	8
Maguire & Son	436	0	0
J. Richardson & Co.	433	0	0
G. Davis	390	0	0
Jones & Attwood	390	0	0
T. Green & Son, Ltd.	£389	0	0
J. Defries & Sons, Ltd.	327	0	0
J. C. & J. S. Ellis, Ltd.	311	10	0
J. Fraser & Son, Millwall Boiler Works*	284	0	0

* Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the existing low-pressure hot-water apparatus at the Enfield-road School, De Beauvoir Town, for the School Board for London:—

W. G. Cannon & Sons	£216	0	0
Duffield & Co.	210	10	0
Fraser & Fraser, Ltd.	193	0	0
Russell & Co.	186	10	0
J. F. Clarke & Sons	183	0	0
J. Fraser & Son	£164	0	0
Vaughan & Brown, Ltd., Kirby-street*	147	0	0
Wontner-Smith, Gray, & Co.	146	18	0

* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of two temporary iron buildings Salisbury-row, Walworth, for the School Board for London. Mr. T. J. Bailey, Architect:—

Hill & Smith	£1,423	0	0
M. T. Shaw & Co.	1,345	0	0
T. Cruwys	1,332	0	0
E. C. & J. Keay, Ltd.	1,254	0	0
D. Charteris	1,244	19	0
J. Lysaght, Ltd.	1,239	0	0
W. Harbrow	£1,235	15	0
Humphreys, Ltd.	1,217	0	0
I. Dixon & Co.	1,197	0	0
Croggon & Co., Ltd., Upper Thames-st.*	1,150	0	0

* Recommended for acceptance by the Works Committee.

LONDON.—For providing and fixing a complete system of low-pressure hot-water apparatus for warming the Napier-street School, Shepherdess Walk, Hoxton, for the School Board for London:—

Comyn, Ching & Co.	£605	10	0
Strode & Co.	603	0	0
W. G. Cannon & Sons	681	0	0
Jones & Attwood	623	0	0
J. Defries & Sons, Ltd.	615	0	0
James Gray	£608	10	0
J. Fraser & Son	523	0	0
J. F. Clarke & Sons, Moorgate-street*	521	0	0

* Recommended for acceptance by the Works Committee.

LONDON.—For providing additional heating surface to improve the efficiency of the present system of low-pressure hot-water apparatus at the Heber-road School, East Dulwich, for the School Board for London:—

W. G. Cannon & Sons	£249	10	0
J. Fraser & Son	239	0	0
Matthews & Yates, Ltd.	210	10	0
Wenham & Waters, Ltd.	139	10	0
J. C. & J. S. Ellis, Ltd.	£127	0	0
J. F. Clarke & Sons	122	0	0
J. Wontner-Smith, Gray, & Co., Finsbury-pavement*	99	17	6

* Recommended for acceptance by the Works Committee.

MARYCULTER (N.B.).—For additions to school-buildings (West Schoolhouse). Messrs. Ellis & Wilson, architects, 181A, Union-street, Aberdeen. Quantities by architects:—

Masonry.—John Shaw, Blairs, Aberdeen
Carpentry.—Jas. Troup, Maryculter, Aberdeen
Slating.—Wm. Milne, Aberdeen
Plastering.—Jas. Simpson, „
Plumbing.—Wm. Horne, „
Painting.—Jas. Garvie & Sons, Aberdeen
£350

MILTON-NEXT-SITTINGBOURNE.—For the supply of 240 tons Guernsey granite (broken), also 25 tons granite chips, for the Urban District Council. Mr. A. B. Acworth, surveyor, Milton:—

	Granite. s. d.	Chips. s. d.
Le Maitre, Alderney*	10 11	9 3
W. Sommerfield	12 6	10 0
Lyon & Co.	10 11	—
Mowlem & Co.	11 8	9 3
W. Griffiths	11 10	9 6
A. & F. Manuelle	11 2	8 10
Tricher & Sons	12 3	10 1
Paramour & Son	12 9	11 9
Pennings	12 2	9 8

* Accepted.

300 yards Surface Picked Kerbs.

	s. d.
Ovenden	3 8
Knight & Co.	3 10
Clinch	3 11

MIRFIELD (Yorks.).—Accepted for rebuilding the "Pear Tree" inn, for Messrs. S. Webster & Sons, Ltd. Messrs. Jackson & Fox, architects, 22, George-street, Halifax:—

Excavating and Masonry.—W. & J. Milner, Mirfield £593 2
Joinery.—Wm. Halliwell, Brighouse 260 0
Plumbing.—R. P. Stafford, Halifax 75 0
Slating and Plastering.—Saml. Johnston & Sons, Mirfield 125 0
Painting.—J. Broscombe, Mirfield 18 5

MORLEY (Yorks.).—For the erection of four houses, Dartmouth-avenue, High-street, for Mrs. B. Lobley. Mr. T. A. Buttery, architect, Queen-street, Morley:—

Masonry.—J. & J. Sugden, Morley £375 0
Joinery.—J. Hook, Armley 105 0
Plastering.—E. Wilson, Morley 25 0
Slating.—Sharp & Harper, Leeds 26 10
Plumbing.—A. Fawcett, Morley 21 5

MITCHAM.—For the construction of a new length of low-level sewer, for the Croydon Rural District Council. Mr. Robt. M. Chart, F.S.I., Surveyor, Union Bank Chambers, Croydon, and Mitcham. Quantities by Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C.:—

W. Langridge	£2,109	0	0
King	1,959	0	0
Free & Sons	1,620	0	0
G. Bell	1,475	0	0
J. Kavanagh	1,350	0	0
W. Wadey	£1,275	0	0
E. Iles	1,245	0	0
H. Lee	1,129	10	4
S. Hudson, Streatham Hill*	1,011	17	10

* Accepted subject to execution of bond.

NANTWICH.—Accepted for the supply of c.-i. pipes, branches, &c., for Bulkeley water-supply (Contract No. 1), for the Rural District Council. Mr. J. A. Davenport, engineer, 152, Hospital-street, Nantwich. Quantities by engineer:—

Cochrane & Co., Woodside New Works, near Dudley—

2-in. pipes.	3-in. pipes.	4-in. pipes.	5-in. pipes.	6-in. pipes.
Per ton.	Per ton.	Per ton.	Per ton.	Per ton.
£4 17 6	£4 15 0	£4 12 6	£4 12 6	£4 10 0

Blakeborough & Son, Brighouse, Yorkshire (for fittings).

NANTWICH.—For the execution of water-supply works, Bulkeley, Contract No. 2, for the Rural District Council. Mr. John Aldersey Davenport, C.E., engineer. Quantities by engineer:—

John Phœnix	£386	1	1
John Eaton	385	1	6
A. H. Hulse	276	8	0
Wm. Shingler	273	2	4
Jno. Matthews	255	0	0
Wm. Lythgoe	£248	0	0
Henry Dodd	240	12	10
Sam Wood	217	10	0
John P. Graty, Willaston, near Nantwich*	202	10	0

* Accepted.

NEWENT (Gloucestershire).—For the Newent extensions, Gloucester Corporation Waterworks. Revised tenders for Contract No. 5: engines, pumps, and boilers (two sets of machinery and three boilers):—

Hunter & English	£10,350	0	0
Fleming & Ferguson	(1) 10,000	0	0
„ „	(2) 11,000	0	0
D. Stewart & Co., Limited	8,280	12	0
Yates & Thorn	7,740	0	0
The Glenfield Co., Limited	6,282	19	0
The Lilleshall Co., Limited	6,047	10	0
G. Waller & Co.	6,040	0	0
Goddard, Massey, & Warner	5,669	7	6
Humpidge, Holborrow, & Co., Limited	(1) 5,664	0	0
„ „ „ „	(2) 6,404	10	0
R. Moreland & Son	5,398	10	0
A. Barclay, Sons, & Co., Limited	5,376	0	0
Summers & Scott, Gloucester (accepted)	5,214	10	0

NEWTON ABBOT.—For the erection of farm buildings, Stubbin's Farm, Ogwell, for Mr. D. R. Scratton. Messrs. Rendell & Symons, F.S.I., surveyors, Newton Abbot. Quantities by surveyors:—

Lewis Reame	£719	0	
Frank Zealley	694	0	
Parker Bros.	£675	0	
H. Mills, Newton Abbot*	669	13	

[Surveyors' estimate, £679 10s.]

* Accepted.

PORTSMOUTH.—For the erection of hospital and nurses' home, for the Guardians of Portsea Island Union. Mr. C. W. Bevis, architect, Elm-grove Chambers, Yarborough-road, Southsea. Quantities by Mr. C. W. Ball, Southsea:—

W. J. Chinchen	£21,993	Sprigings Bros.	£20,094
J. Crockerell	21,579	Clark & Son	19,789
H. Jones	21,293	W. W. Evans, Southsea*	19,300
J. H. Corke	22,259		

* Accepted.

SOUTHEND-ON-SEA.—Accepted, on schedule of prices, for providing and laying 8,000 ft. Tees scoriæ brick channelling and other works, for the Corporation. Mr. Harold Harlock, Borough Surveyor, Clarence-road, Southend:—

M. W. Buxton, Prittlewell, Southend-on-Sea.

VENTNOR.—Accepted for fitting up buffet at the Royal Marine Hotel, Ventnor, Isle of Wight, for Messrs. Bush & Judd, proprietors:—

H. & F. Warne £220

[No competition.]

WASHINGTON (Durham).—For the erection of a house, also additions to school buildings, for the School Board:—

Robt. Hudson, jun.	£2,663	0	0
G. H. Hodgson	2,500	0	0
Isaac Oates	2,331	9	0
M. R. Draper & Sons	2,275	14	6
J. B. Stott	2,226	19	10
Robinson & Hunter	£2,199	8	8
Thomas Hunter	2,126	14	10
J. & R. Thornton	2,070	0	0
John Kell	2,027	18	2
Chr. Groves	2,000	0	0

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WOBURN SANDS (Beds.).—For building offices, for Messrs. Down & Needham:—

Geo. E. Fathers, Bedford (accepted) £—

WOLVERHAMPTON.—Accepted for the erection of house and shop, Coleman-street, for Miss S. Rogers. Mr. J. Mason, architect, Victoria Chambers, Bilston-street, Wolverhampton:—

Benj. Guest £—

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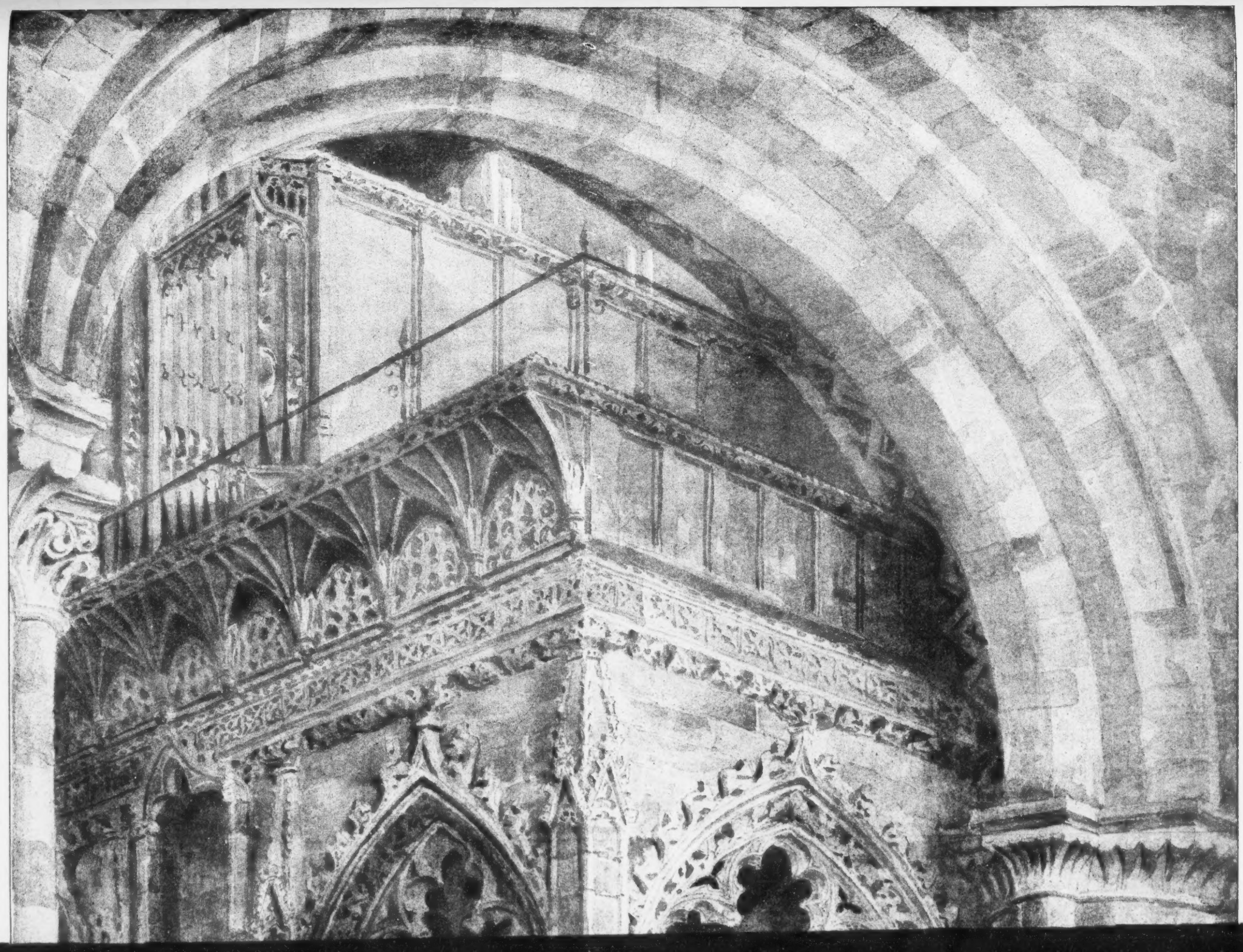

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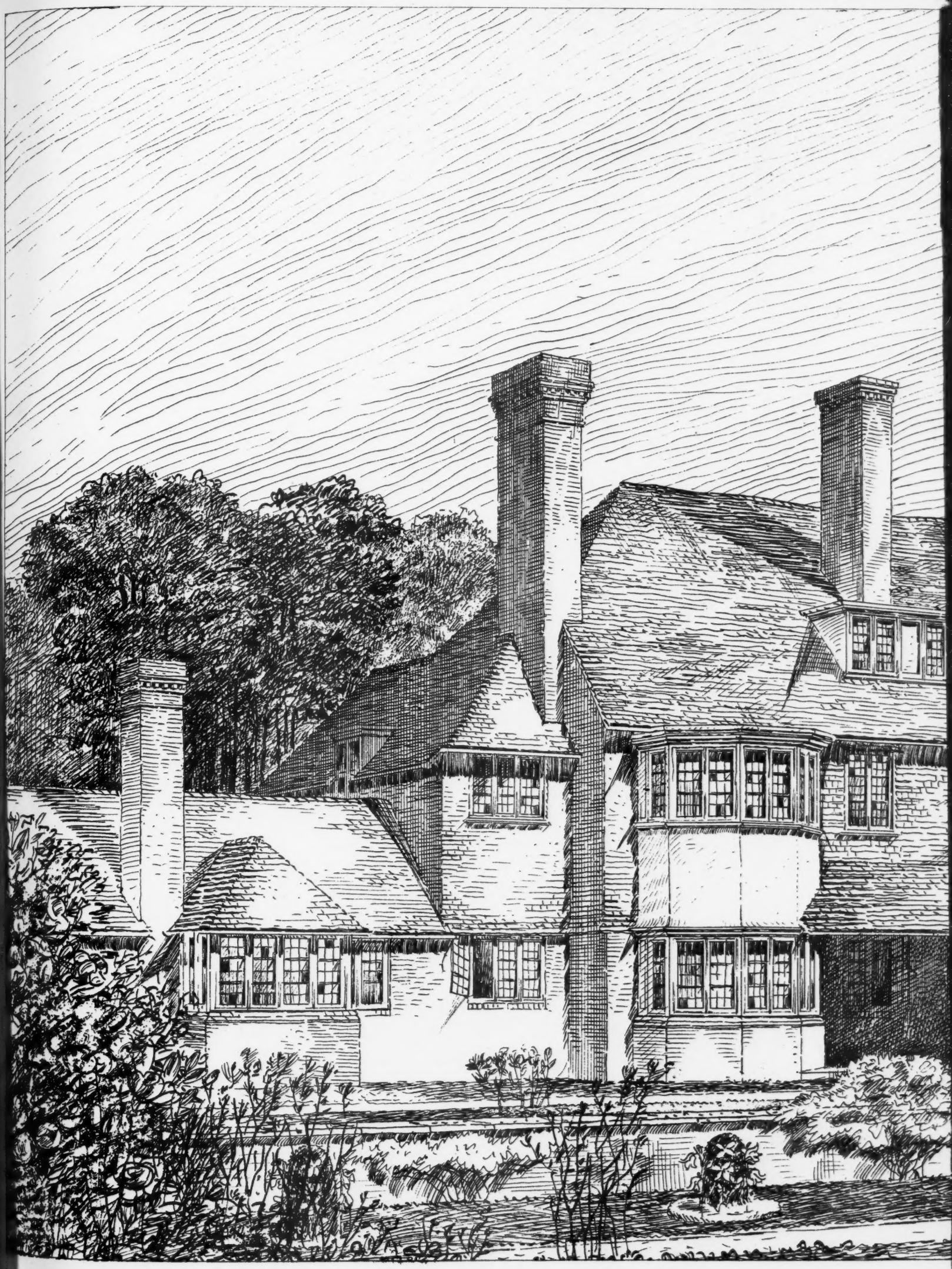

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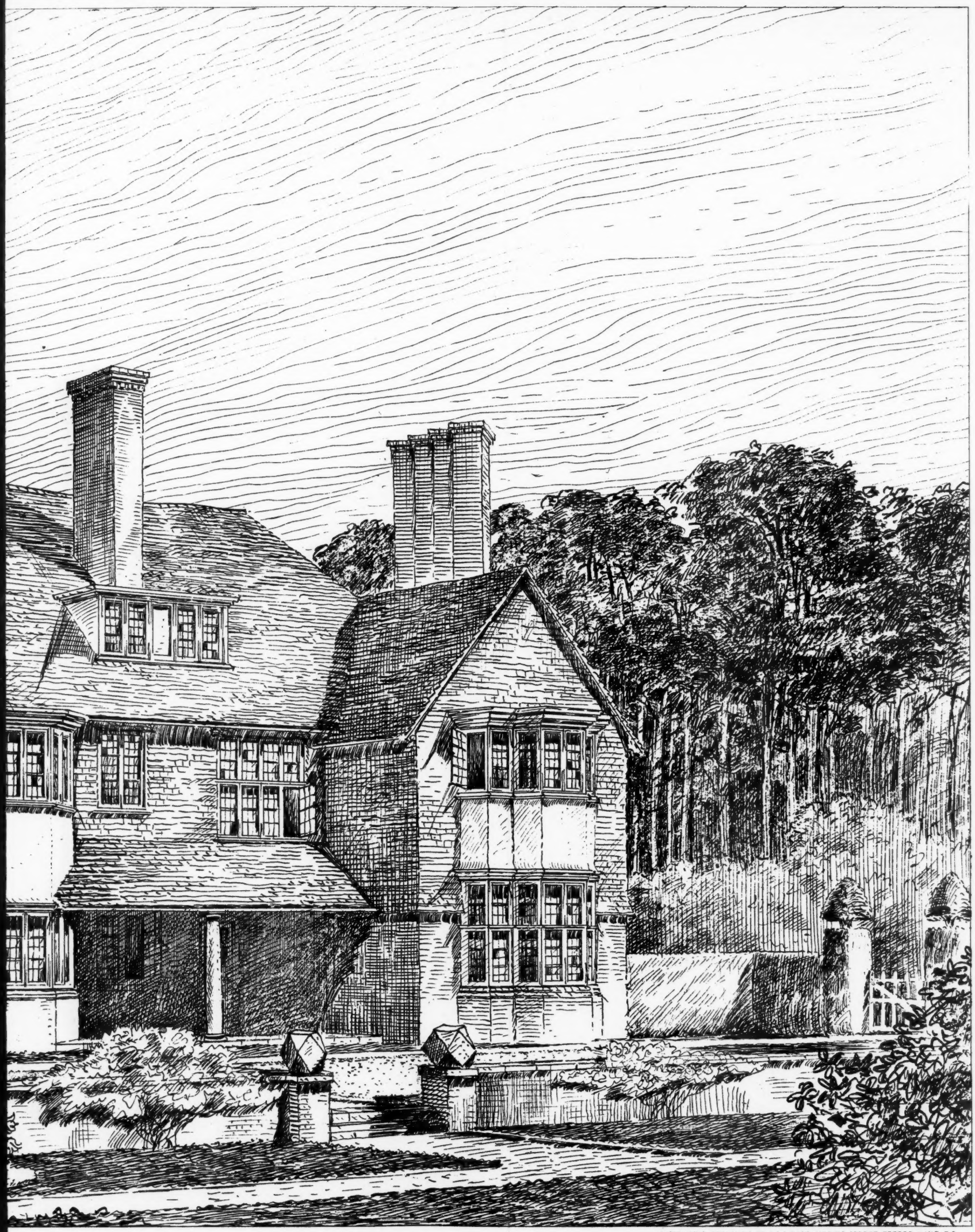

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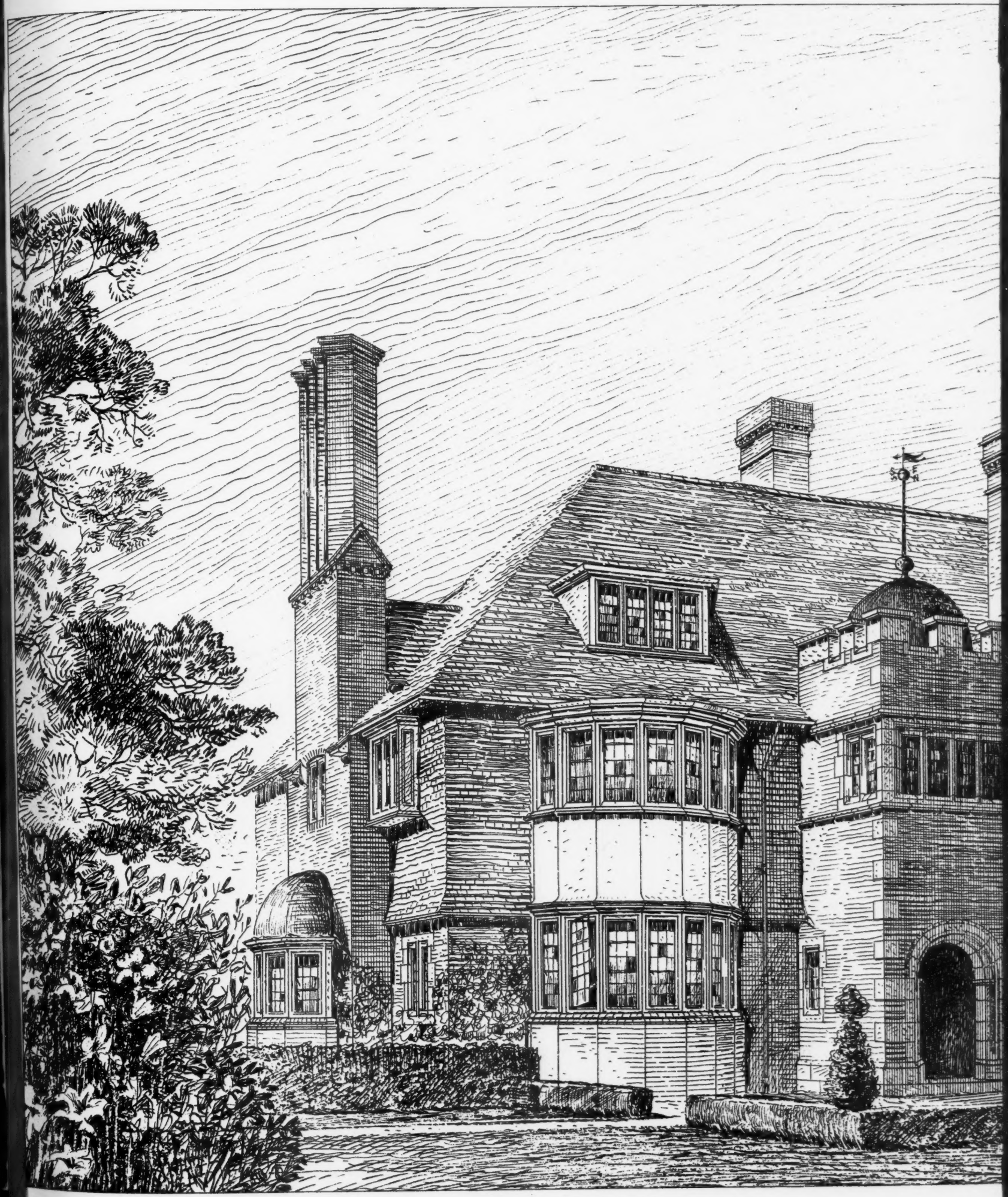

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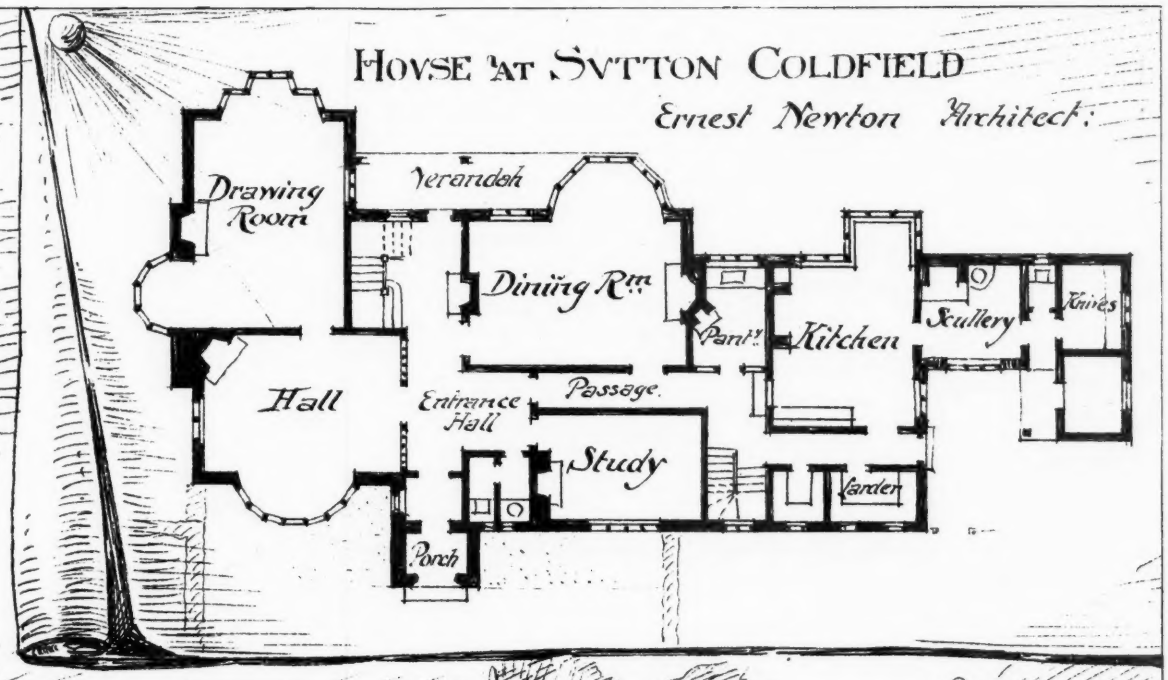
Ernest Newton Architect.



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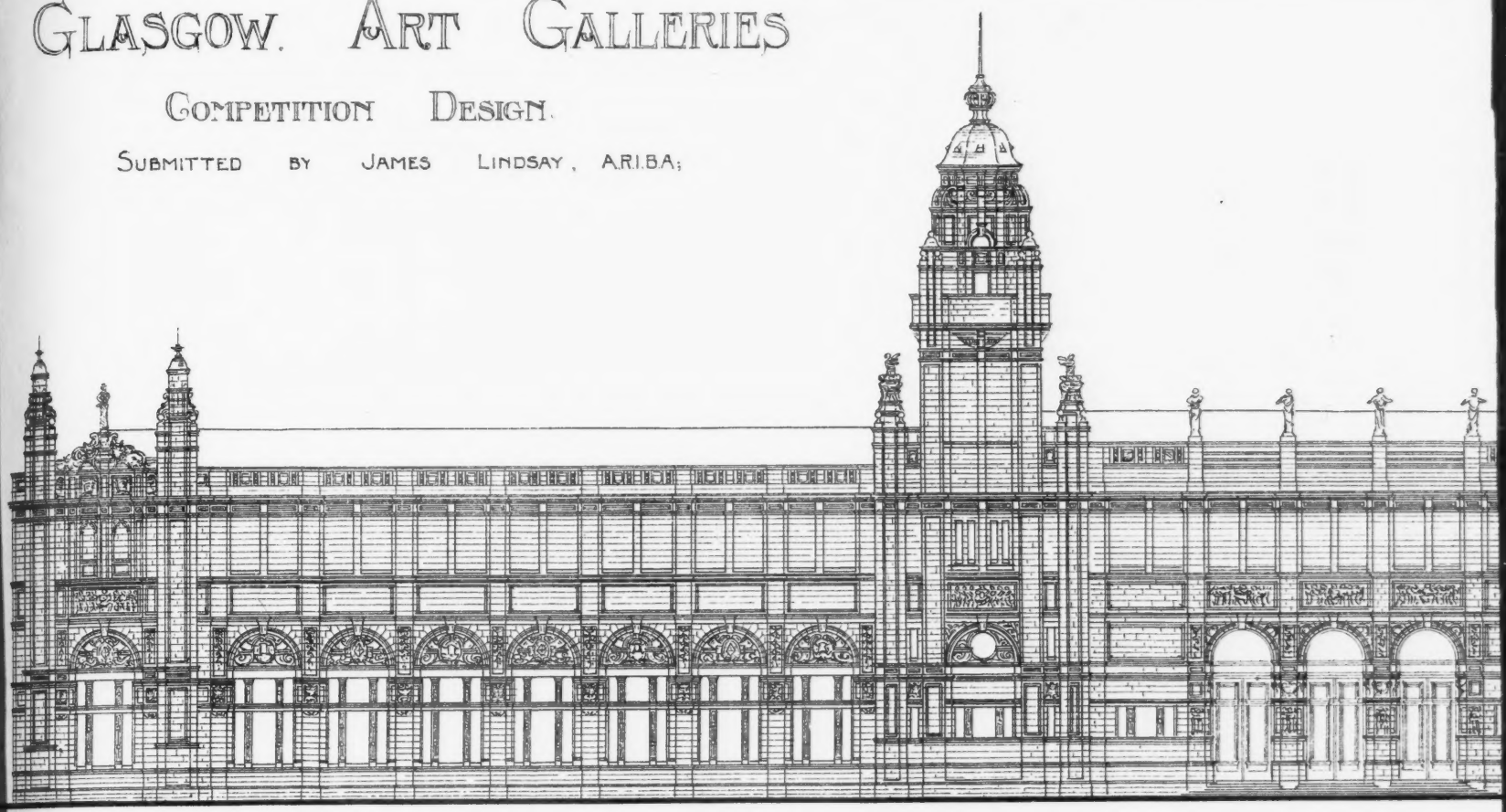

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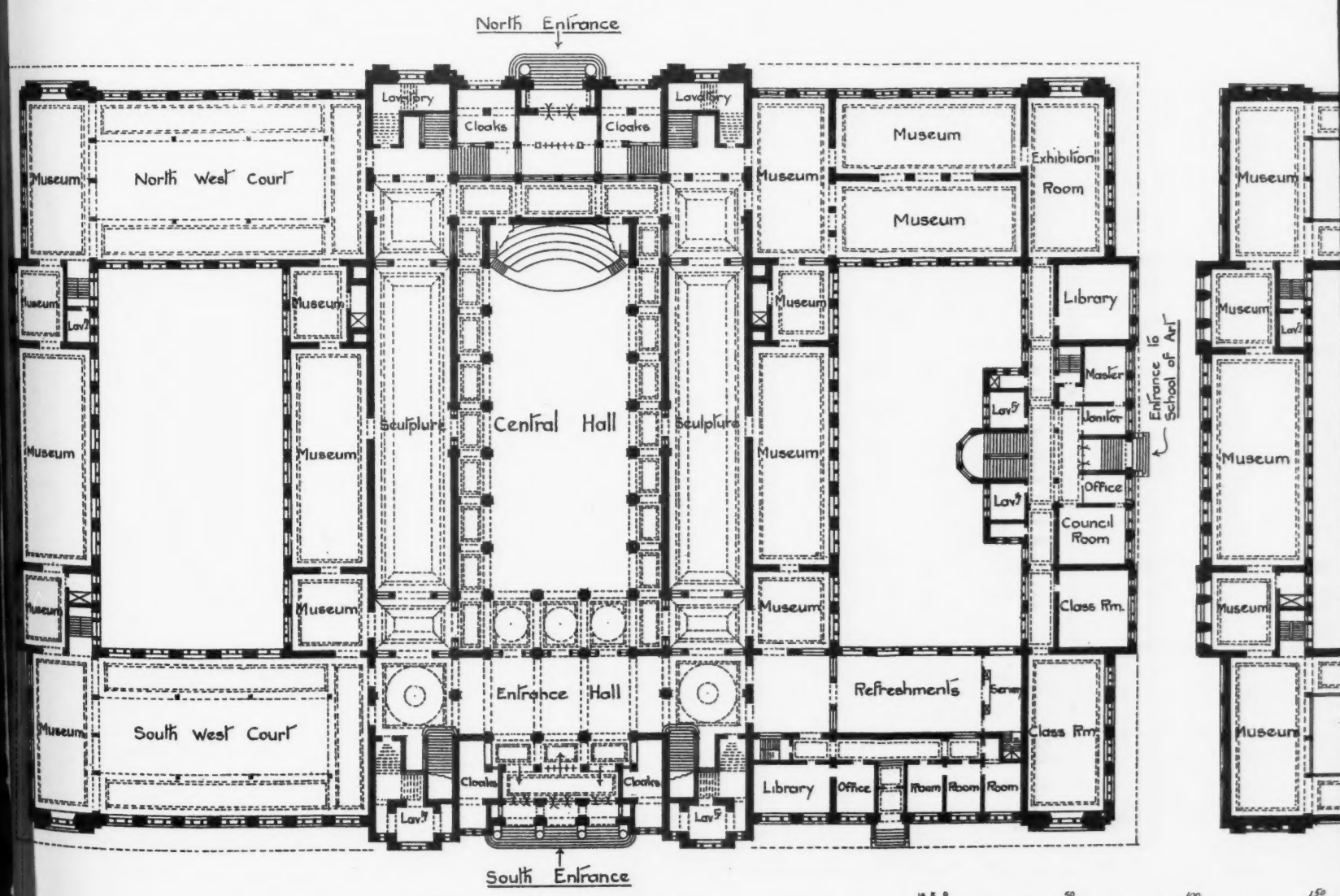
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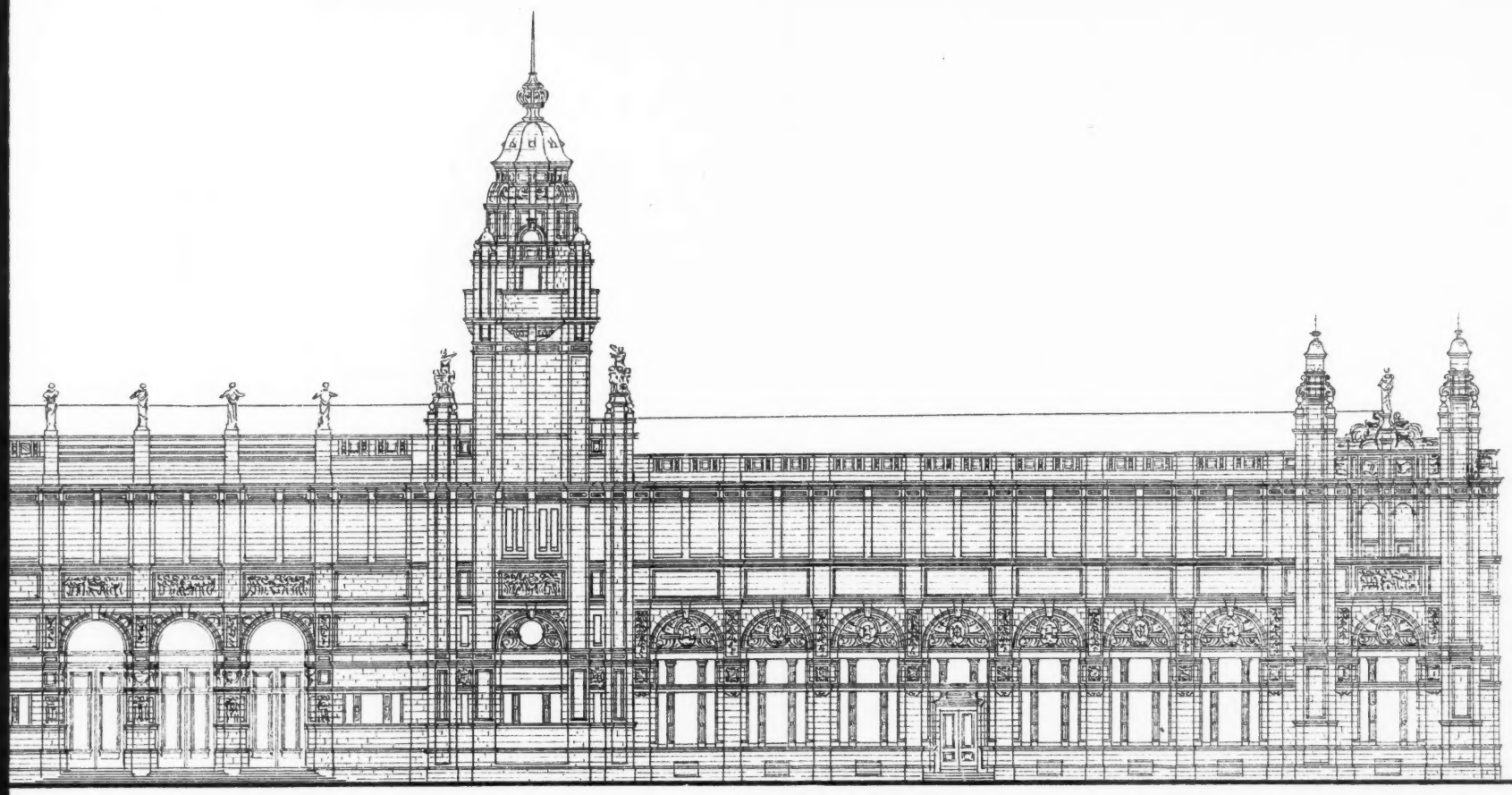

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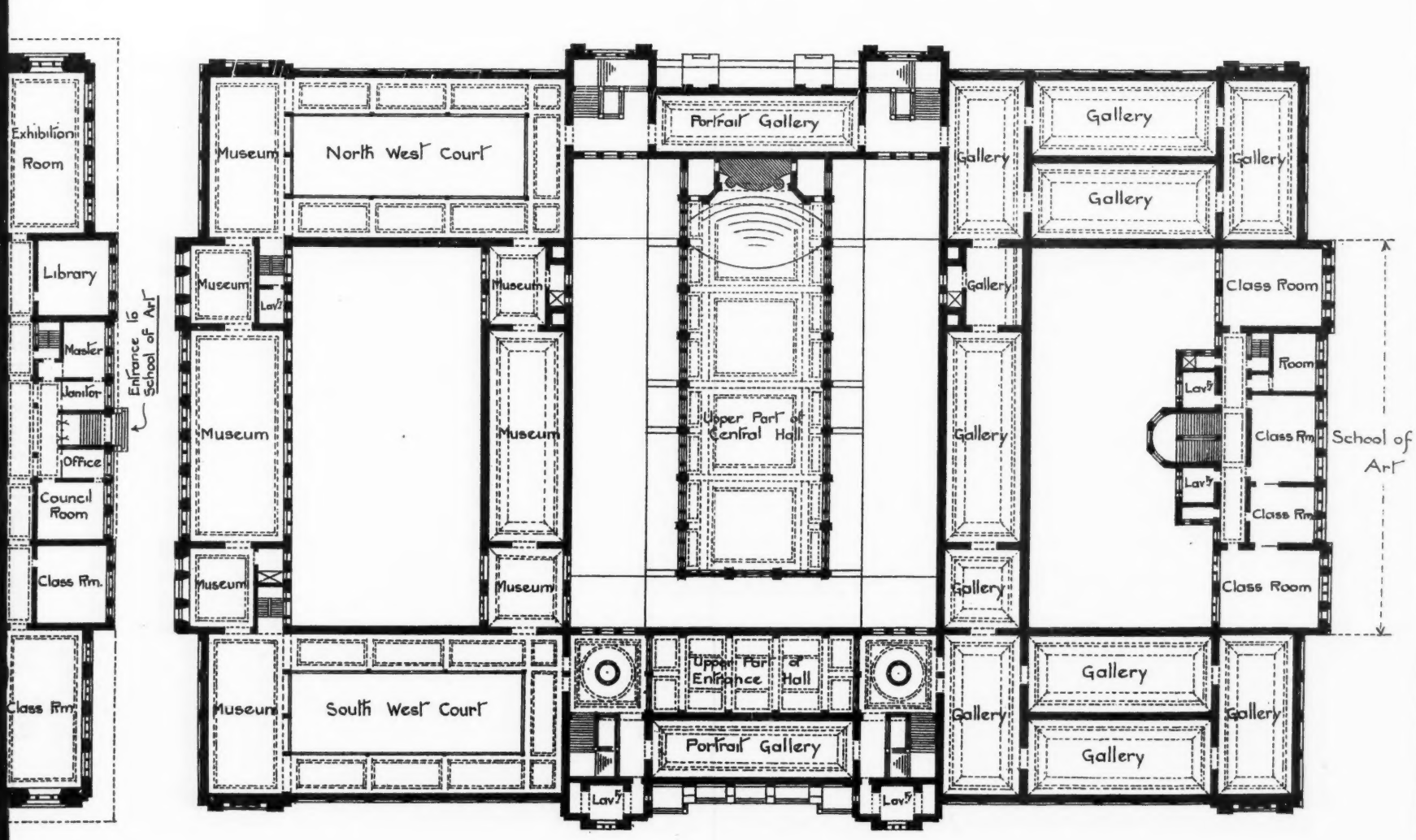

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